

patients, their families, physicians, and nurses [20]. For the second step, we conducted a quantitative study to determine what attributes were considered necessary for a good death, using a large nationwide sample of the general population and bereaved family members [21]. Our third step was to develop a Good Death Inventory (GDI) as a measure for evaluating a good death from the bereaved family member's perspective, and we examined its validity and reliability [22].

Although there are measures to evaluate a good death from the bereaved family member's perspective, few studies exploring contributing factors have been conducted. Teno *et al.* showed that the last place of care influenced the achievement of a good death [12]. However, the correlations between other variables such as patient and family demographics, medical variables, and the achievement of a good death were still unclear. It is important to describe the factors contributing to achieving a good death. It is especially relevant to identify medical variables that contribute to a good death because of the implications for improving clinical interventions by medical practitioners.

The Japanese Ministry of Health, Labor, and Welfare has strongly supported dissemination of specialized palliative care services, with coverage of palliative care units (PCUs) by National Medical Insurance since 1990. The number of PCUs has dramatically increased from 5 in 1990 to 163 in 2006. In contrast, the growth of home-based palliative care programs has been slow, as inpatient palliative care teams were not covered by National Medical Insurance until 2002. Therefore, the most common type of specialized palliative care service in Japan is the PCU. Although the number of PCUs has increased, they cover only 6% of all cancer deaths. In 2004, only 6% of cancer deaths occurred in the home and over 80% of cancer deaths occurred on general wards. Therefore, death on general wards is an important issue in Japan. However, the comparison of the achievement of a good death between these care settings has not been done. Therefore, we aimed in this study, first, to compare the achievement of a good death between inpatient PCUs and general wards; and second, to explore factors including patient and family demographics and medical variables that may contribute to a good death from the bereaved family member's perspective in Japan.

Methods

Participants and procedures

A cross-sectional anonymous questionnaire was administered to bereaved family members of cancer patients who had died in a regional cancer center's general wards and inpatient PCU in Ibaraki

prefecture, Japan. In addition, medical chart review was conducted for these patients with the permission of bereaved family members.

To find potential participants, we identified bereaved family members of patients who died from September 2004 to February 2006. The inclusion criteria were as follows: (1) patient died in PCU or died on the general ward from lung cancer or gastrointestinal cancer; (2) patient was aged 20 years or more; and (3) patient was hospitalized at least 3 days. The exclusion criteria were as follows: (1) participant was recruited for another questionnaire survey for bereaved family members; (2) participant would have suffered serious psychological distress as determined by the primary physician; (3) cause of death was treatment related or due to injury; (4) there was no bereaved family member who was aged 20 years or more; (4) participant was incapable of replying to a self-reported questionnaire; and (5) participant was not aware of the diagnosis of malignancy.

We mailed questionnaires to potential respondents in October 2006 and a reminder was sent in November 2006 to those who did not respond. We asked the primary caregiver to complete the questionnaire. If the respondents did not want to participate in the survey, they were asked to return the questionnaire with 'no participation' indicated, and a reminder was not mailed to them. In addition, we asked the participant to give permission for a medical chart review in accordance with Japanese guidelines for protection of individual information. The ethical and scientific validity of this study was approved by the institutional review boards of Tsukuba Medical Center Hospital.

Measurements

Good death inventory

The GDI evaluates end-of-life care from the bereaved family member's perspective. Fifty-four attributes of a good death were asked using a 7-point Likert scale (1: absolutely disagree, 2: disagree, 3: somewhat disagree, 4: unsure, 5: somewhat agree, 6: agree, 7: absolutely agree). The attributes were generated based on a previous qualitative study [20], quantitative study [21], and literature review [5, 6, 12, 13, 15-17, 23]. The validity and reliability of the GDI have been examined and 18 domains were confirmed [22]. The GDI consisted of 10 core domains including: 'environmental comfort,' 'life completion,' 'dying in a favorite place,' 'maintaining hope and pleasure,' 'independence,' 'physical and psychological comfort,' 'good relationship with medical staff,' 'not being a burden to others,' 'good relationship with family,' and 'being respected as an individual,' and eight optional domains including: 'religious and spiritual comfort,' 'receiving

enough treatment,' 'control over the future,' 'feeling that one's life is worth living,' 'unawareness of death,' 'pride and beauty,' 'natural death,' and 'preparation for death.' The eight optional domains were not important for all Japanese, however, some Japanese emphasized that these domains were significant. We calculated the domain score by summing up attributes. The range of each domain score was from 7 to 21. A high score indicated the achievement of a good death in each domain. The content validity of the GDI was ensured by our previous qualitative and quantitative studies. The GDI has sufficient factor validity and concurrent validity with overall satisfaction. The Cronbach's alpha of the GDI ranged from 0.74 to 0.95. The intraclass correlation coefficients (ICC) for test-retest reliability ranged from 0.44 to 0.72 except for 'not being a burden for others' (ICC = 0.38). The ICC of all 18 domains was 0.52; of the total of the 10 core domains it was 0.59 and of the total of the eight optional domains it was 0.50 [22]. The questionnaire and domains of the GDI are described in the Appendix.

Patient and family demographics

The patients' age, sex, and marital status were extracted from medical chart. We asked the bereaved family member's age, sex, health status during the caregiving period, relationship with the patient, frequency of attending the patient, religiousness, education, and household income during the caregiving period.

Medical variables and medical intervention in the last 48 h

The medical variables extracted from the charts were: place of care (PCU or general ward), type of room (private or not), duration since diagnosis, number of hospital days, short stay at home in the last 30 days, cancer stage, site of cancer, treatment experience, Do-Not-Resuscitate order (present or absent), cardiopulmonary resuscitation, and chemotherapy in the last 14 days. Medical interventions in the last 48 h that were extracted were: use of oxygen, palliative sedation, insertion/placement of tubes, parenteral medication, nonparenteral medication, artificial hydration, intravenous hyperalimentation, vasopressor, antibiotic, blood transfusion, and opioid medication. Palliative sedation was defined as a sedative drug such as midazolam or haloperidol that was administered to the patient with the aim of sedation and was recorded by the physician in the medical chart. The details of medical variables and medical interventions in the last 48 h in this regional cancer center have been described in another paper [24]. At the beginning of the review, 20 randomly selected medical charts were independently abstracted by two researchers

to assure inter-rater reliability. The average concordance rate was 93%.

Analysis

We first described participant characteristics such as patient and family demographics, medical variables, and medical interventions in the last 48 h. Second, we compared the evaluation of a good death between PCUs and general wards using Welch's *t* test. Finally, to explore factors contributing to a good death from the bereaved family member's perspective, we conducted multiple regression analyses. The dependent variables were 18 domains of the GDI. The explanatory variables were patient and family demographics, medical variables, and medical interventions in the last 48 h. Because of the distorted distribution, we did not use the following variables as explanatory variables: cardiopulmonary resuscitation, intravenous hyperalimentation, and blood transfusion. We adopted the backward variable selection method in the multiple regression analyses and we set the significance level to be included in the model as $P < 0.05$. The place of death was included in the model because medical treatment would be different between the two settings. All analyses were performed using the statistical package SAS version 9.1 (SAS Institute, Cary, NC).

Results

There were 388 potential participants. Subjects were excluded for the following reasons: recruitment in another questionnaire survey for bereaved family members ($n = 23$), serious psychological distress as determined by the primary physician ($n = 8$), cause of death was treatment related or due to injury ($n = 4$), no bereaved family members older than 20 ($n = 4$), and other ($n = 5$). Of 344 questionnaires sent to the remaining bereaved family members, 11 were undeliverable and 215 were returned (response rate, 65%). Among these, 23 individuals refused to participate and three responses were excluded due to missing data. In addition, 24 individuals refused the medical chart review. Thus, 165 responses were analyzed (48%).

Participant characteristics

Participant characteristics are shown in Table 1. Patient characteristics were as follows: the mean age \pm standard deviation age was 70 ± 11 , males made up 56% of the total, and 73% of the participants were married. As for bereaved family members, the mean age was 57 ± 13 , and 33% were males. As for medical variables, 74% of the patients were cared for in the PCU, the mean number of hospital days was 41 ± 38 , 21% of the

Table 1. Characteristics of participants (N = 165)

	n	%
Patient demographics		
Age, years (mean ± SD)	70 ± 11	
Sex (male)	92	56
Marital status (married)	121	73
Bereaved family member demographics		
Age, years (mean ± SD)	57 ± 13	
Sex (Male)	54	33
Health Status		
Good	42	25
Moderate	94	57
Fair	23	14
Poor	4	2
Relationship (spouse)	77	47
Frequency of attending patient		
Every day	119	72
4-6 days/week	14	8
1-3 days/week	21	13
Less than 1 day/week	8	5
Religiousness		
None	75	45
Fair	40	24
Moderate	28	17
Much	12	7
Education		
Junior high school	28	17
High school	69	42
College	36	22
University	30	18
Household income (thousand yen)		
-249	24	15
250-499	64	39
500-749	34	21
750-999	19	12
1000-	15	9
Medical variables		
Place of care		
General ward	43	26
Palliative Care Unit	122	74
Type of room (private)	145	88
Duration from diagnosis, m (mean ± SD)	27 ± 33	
Hospital days (mean ± SD)	41 ± 38	
Short stay at home in the last 30 days	14	8
Cancer stage		
Local	4	2
Regional	25	15
Distant metastasis	133	81
Site of cancer		
Lung	35	21
Gastrointestinal	82	50
Other	48	29
Treatment experience (multiple answer)		
Surgery	82	50
Chemotherapy	103	62
Radiotherapy	74	45
Do-Not-Resuscitate order (present)	160	97
Cardiopulmonary resuscitation	1	1
Chemotherapy in the last 14 days	7	4
Medical intervention in the last 48 h		
Oxygen inhalation	143	87
Palliative sedation	32	19
Insertion/placement of tubes	30	18
Parenteral medication	159	96

Table 1. (continued)

	n	%
Nonparenteral medication	78	47
Artificial hydration	140	85
Intravenous hyperalimination	4	2
Vasopressor	12	7
Antibiotic	58	35
Blood transfusion	3	2
Opioid medication	143	87

Note: Several total percent do not equal 100% due to missing values.

total had lung cancer, and 50% had gastrointestinal cancer. As for medical interventions in the last 48 h, 19% received palliative sedation, 85% artificial hydration, 7% vasopressors, 35% antibiotics, and 87% received opioid medications.

Comparison of an evaluation of a good death between PCU and general wards

We show the comparison of evaluations of a good death between PCUs and general wards in Table 2. For patients whose last place of care was a PCU, participants evaluated that patients were more likely to achieve a good death for the domains 'environmental comfort' ($P < 0.001$), 'physical and psychological comfort' ($P = 0.04$), 'being respected as an individual' ($P = 0.01$), and 'natural death' ($P = 0.02$).

Factors contributing to evaluation of a good death (10 core domains)

We show the results of multiple regression analyses regarding 10 core good death domains in Table 3. 'Environmental comfort' correlated with place of care (PCU, $P < 0.001$), family member's older age ($P < 0.001$), and family member's poor health ($P = 0.03$). 'Life completion' correlated with patient's older age ($P < 0.001$), and family member's relationship (spouse, $P < 0.001$). 'Dying in a favorite place' correlated with patient's older age ($P = 0.003$), family member's relationship (spouse, $P < 0.001$), and family member's education ($P = 0.005$). 'Maintaining hope and pleasure' correlated with patient's older age ($P = 0.04$), early cancer stage ($P = 0.01$), duration since diagnosis ($P = 0.04$), and not receiving vasopressors ($P < 0.001$). 'Physical and psychological comfort' correlated with place of care (PCU, $P = 0.01$), patient's older age ($P = 0.02$), family member's older age ($P < 0.001$), not receiving palliative sedation ($P = 0.03$), and not receiving antibiotic ($P < 0.001$). 'Good relationship with medical staff' correlated with patient's older age ($P = 0.04$), family member's older age ($P = 0.01$), early cancer stage ($P < 0.001$), and receiving opioid medication ($P = 0.003$). 'Not being a burden to others' correlated with patient's older age ($P = 0.005$) and treatment experience (no

Table 2. Evaluation of good death in PCU and general wards

	PCU		General wards		P-value
	Mean	SD	Mean	SD	
Ten core domains					
1. Environmental comfort	5.7	1.0	4.7	1.5	<0.001
2. Life completion	4.1	1.7	4.3	1.6	0.60
3. Dying in a favorite place	5.0	1.5	4.5	1.9	0.05
4. Maintaining hope and pleasure	4.1	1.5	3.8	1.7	0.31
5. Independence	3.6	1.8	4.0	1.8	0.10
6. Physical and psychological comfort	5.0	1.5	4.5	1.7	0.04
7. Good relationship with medical staff	5.6	1.0	5.3	1.3	0.07
8. Not being a burden to others	4.0	1.5	3.8	1.3	0.19
9. Good relationship with family	5.1	1.2	4.8	1.2	0.18
10. Being respected as an individual	5.9	0.9	5.4	1.3	0.01
Eight optional domains					
11. Religious and spiritual comfort	2.5	1.6	3.0	1.8	0.12
12. Receiving enough treatment	5.1	1.5	5.0	1.6	0.90
13. Control over the future	4.0	1.7	3.9	1.7	0.76
14. Feeling that one's life is worth living	5.2	1.3	5.2	1.3	0.89
15. Unawareness of death	3.6	1.4	4.0	1.5	0.10
16. Pride and beauty	3.4	1.3	3.5	1.6	0.83
17. Natural death	5.5	1.2	5.0	1.4	0.02
18. Preparation for death	4.8	1.4	4.8	1.3	0.92

Note: Statistical test comparing two places of care was by Welch's *t* test. PCU: Palliative Care Unit.

surgery, $P = 0.01$). 'Good relationship with family' correlated with place of care (PCU, $P = 0.007$), low household income ($P = 0.02$), type of room (private, $P = 0.03$), and not receiving artificial hydration ($P = 0.02$). 'Being respected as an individual' correlated with place of care (PCU, $P = 0.04$), patient's older age ($P = 0.003$), patient's marital status (not married, $P = 0.04$), family member's relationship (spouse, $P = 0.02$), early cancer stage ($P = 0.008$), treatment experience (chemotherapy, $P = 0.004$), type of room (private, $P = 0.03$), not receiving chemotherapy in the last 14 days ($P = 0.002$), and palliative sedation ($P = 0.03$).

Factors contributing to evaluation of a good death (optional domains)

We show the results of multiple regression analyses regarding eight optional good death domains in Table 4. 'Religious and spiritual comfort' correlated with family member's younger age ($P = 0.01$) and family's religiousness ($P < 0.001$). 'Receiving enough treatment' correlated with patient's older age ($P = 0.03$), family member's older age ($P = 0.01$), and opioid medication ($P = 0.009$). 'Feeling that one's life is worth living' correlated with the duration since diagnosis ($P = 0.04$). 'Unawareness of death' correlated with family member's older age ($P = 0.002$), patient's marital status (not married,

Table 3. Factors contributing to a good death (10 core domains)

	β	P-value
1. Environmental comfort ($R^2 = 0.219$)		
Place of care (PCU)	1.05	<0.001
Family member's age	0.03	<0.001
Family member's health	-0.31	0.02
2. Life completion ($R^2 = 0.257$)		
Place of care (PCU)	0.55	0.06
Patient's age	0.08	<0.001
Family relationship (spouse)	1.01	<0.001
3. Dying in a favorite place ($R^2 = 0.307$)		
Place of care (PCU)	0.10	0.76
Patient's age	0.03	0.003
Family relationship (spouse)	0.89	<0.001
Family member's education	-0.36	0.005
4. Maintaining hope and pleasure ($R^2 = 0.168$)		
Place of care (PCU)	0.34	0.32
Patient's age	0.02	0.04
Cancer staging	-0.72	0.01
Duration from diagnosis	0.01	0.04
Vasopressor	-2.21	<0.001
5. Independence ($R^2 = 0.018$)		
Place of care (PCU)	-0.54	0.11
6. Physical and psychological comfort ($R^2 = 0.312$)		
Place of care (PCU)	0.71	0.01
Patient's age	0.02	0.02
Family member's age	0.04	<0.001
Palliative sedation	-0.64	0.03
Antibiotic	-0.85	<0.001
7. Good relationship with medical staff ($R^2 = 0.196$)		
Place of care (PCU)	0.22	0.26
Patient's age	0.02	0.04
Family member's age	0.02	0.01
Cancer staging	-0.69	<0.001
Opioid medication	0.82	0.003
8. Not being a burden to others ($R^2 = 0.115$)		
Place of care (PCU)	0.52	0.06
Patient's age	0.03	0.005
Treatment experience (surgery)	-0.61	0.01
9. Good relationship with family ($R^2 = 0.115$)		
Place of care (PCU)	0.76	0.007
Household income	-0.18	0.02
Type of room (private)	0.87	0.03
Artificial hydration	-0.65	0.02
10. Being respected as an individual ($R^2 = 0.302$)		
Place of care (PCU)	0.48	0.04
Patient's age	0.02	0.003
Patient's marital status (married)	-0.46	0.04
Family relationship (spouse)	0.51	0.02
Cancer staging	-0.48	0.008
Treatment experience (chemotherapy)	0.52	0.004
Type of room (private)	0.73	0.03
Chemotherapy in the last 14 days	-1.31	0.002
Palliative sedation	0.46	0.03

Note: Multiple regression analyses with backward variable selection method ($P < 0.05$). Place of death was included in the model absolutely. PCU: Palliative Care Unit.

$P = 0.006$), family member's sex (female, $P = 0.01$), and not receiving palliative sedation ($P = 0.001$). 'Pride and beauty' correlated with patient's older age ($P < 0.001$), and opioid medication ($P = 0.003$). 'Natural death' was correlated with patient's marital status (not married,

Table 4. Factors contributing to a good death (8 optional domains)

	β	P-value
11. Religious and spiritual comfort ($R^2 = 0.369$)		
Place of care (PCU)	-0.25	0.35
Family member's age	-0.02	0.01
Family member's religiousness	0.99	<0.001
12. Receiving enough treatment ($R^2 = 0.137$)		
Place of care (PCU)	0.03	0.92
Patient's age	0.02	0.03
Family member's age	0.03	0.01
Opioid medication	1.10	0.009
13. Control over the future		
Place of care (PCU)	0.45	0.16
14. Feeling that one's life is worth living ($R^2 = 0.034$)		
Place of care (PCU)	0.06	0.83
Duration from diagnosis	0.01	0.04
15. Unawareness of death ($R^2 = 0.162$)		
Place of care (PCU)	0.31	0.23
Family member's age	0.03	0.002
Patient's marital status (married)	-0.70	0.006
Family member's sex (male)	-0.59	0.01
Palliative sedation	-0.72	0.001
16. Pride and beauty ($R^2 = 0.187$)		
Place of care (PCU)	-0.34	0.18
Patient's age	0.05	<0.001
Opioid medication	1.02	0.003
17. Natural death ($R^2 = 0.143$)		
Place of care (PCU)	0.26	0.27
Patient's marital status (married)	-0.72	0.002
Opioid medication	1.06	0.001
18. Preparation for death ($R^2 = 0.100$)		
Place of care (PCU)	-0.11	0.68
Patient's age	0.02	0.02
Frequency of family attending to patient	-0.32	0.02
Oxygen inhalation	-0.66	0.04
Opioid medication	0.72	0.05

Note: Multiple regression analyses with backward variable selection method ($P < 0.05$). Place of death was included in the model absolutely. PCU: Palliative Care Unit.

$P=0.002$) and opioid medication ($P=0.001$). 'Preparation for death' correlated with patient's older age ($P=0.02$), high frequency of family attending to patient ($P=0.02$), oxygen use ($P=0.04$), and opioid medication ($P=0.05$).

Discussion

This is the first study to explore factors contributing to the evaluation of a good death from the bereaved family member's perspective using reliable measures. We found, first, that death in the PCU was described as a good death for some aspects including 'environmental comfort,' 'physical and psychological comfort,' 'being respected as an individual,' and 'natural death.' These results suggest that Japanese inpatient PCUs provide the dying patient not only environmental comfort but also whole person care. On the other hand, there were no differences for the other good death domains. The preference for place of care

was influenced by the patient's concept of a good death [25]. The referral to a PCU should be according to the patient's preferences and provision of information regarding the merits of the PCU. Second, we investigated many factors contributing to evaluation of a good death including not only patient and family demographics but also some medical variables. We found that patient's and family member's age and other demographic factors correlated with the evaluation of a good death. In addition, we found that life prolongation treatment and aggressive treatment such as chemotherapy in the last 2 weeks were barriers to attainment of a good death.

The patient's and family member's age was correlated with many aspects of a good death. Tsai *et al.* reported that patient age was not associated with a good death by proxy (medical practitioner) good death assessment [26]. This discrepancy may be due to the person doing the rating. Japanese bereaved family members evaluate a good death for older patient age. In other words, these results suggest that death at younger ages tended to be evaluated as a bad death. The older the family member, the more positively the family would look on the patient's death. The patient's marital status (not married) was associated with several good death domains. This might be because the mean age of unmarried patients was higher than married patients (76 vs 67). The reason for the mean age difference would be from including 'widow' in the unmarried population. In addition, several other demographic variables contributed to a good death. We should note that demographic variables influenced the evaluation of a good death from the bereaved family member's perspective, and for the proper evaluation of the intervention for a good death, we ought to adjust for these variables in the analysis.

Life-prolonging treatments such as vasopressors, antibiotics, and artificial hydration were barriers to achieving a good death. According to a nationwide opinion survey, most Japanese do not desire unnecessary life-prolonging treatment [27]. Withholding this type of treatment might contribute to a good death in Japan. Chemotherapy in the last 2 weeks was also a barrier to a good death. In Western countries, aggressive treatment for the dying cancer patient was identified as an indicator of poor quality [28-30]. Our results confirmed these previous studies. Withholding aggressive treatment for the dying patient contributes to a good death.

Opioid medication was positively associated with a good death. In Japan, opioid consumption per capita is significantly lower than in Western countries [31]. Appropriate opioid medication might contribute to a 'good relationship with medical staff' and 'receiving enough treatment' in the good death domains because bereaved family

members valued appropriate medical treatment. In addition, opioid use contributed to a good death in the domains of 'pride and beauty,' 'natural death,' and 'preparation for death.' In Japan, although there are misconceptions regarding opioid medications, use of opioids might contribute to a good death from the bereaved family's perspective [32].

Palliative sedation was negatively associated with the evaluation of a good death. Many patients with palliative sedation probably suffered from physical and psychological symptoms. Therefore, the bereaved family members would evaluate this situation as a bad death for these patients. As a result, palliative sedation would be negatively associated with physical and psychological comfort. That is to say, physically and psychologically distressed patients would be more likely to receive palliative sedation. In addition, Morita reported that 25% of bereaved family members were distressed with palliative sedation therapy [33], expressing guilt, helplessness, and physical and emotional exhaustion [34]. The distress of family members might have influenced the rating of a good death. On the other hand, palliative sedation was positively associated with 'being respected as an individual.' This might indicate that the family felt that the palliative sedation was alleviating the patient's symptoms. In Japan, clinical guidelines for palliative sedation therapy have been established [35]. In accordance with these guidelines, it is important to provide sufficient information about palliative sedation to the patient and family and to allow for discussion.

Having a private room was positively correlated with a 'good relationship with family' and 'being respected as an individual.' Staying in a private room enhanced the family relationships and patient's dignity. Cancer staging was correlated with 'maintaining hope and pleasure,' 'good relationship with medical staff,' and 'being respected as an individual.' Communication with advanced-stage cancer patients and their families is a relevant issue in Japan [36].

The limitations of this study are as follows: First, the response rate was 48% of potential participants. We believe, however, this is not a fatal flaw because the objective of this study was to explore factors contributing to evaluation of a good death. Second, this study was conducted at one regional cancer center. Third, although over 80% of deaths occurred on general wards in Japan, only 26% of the deaths in this institution occurred on general wards. Therefore, the results of this study might not be generalizable to other settings. Lastly, R^2 values of multiple regression analyses are generally low. This implies that other potential variables associated with a good death exist. It is necessary to explore these factors in further research.

Conclusions

In conclusion, we found that death in the PCU achieved a good death for some domains including 'environmental comfort,' 'physical and psychological comfort,' 'being respected as an individual,' and 'natural death.' We found that the patient's and family member's age and other demographic factors, life-prolonging treatment, and aggressive treatment were barriers to attainment of a good death. Moreover, opioid medication might have contributed to a good death. Withholding life-prolonging treatment and aggressive treatment from the dying patient and appropriate use of opioids may be associated with the achievement of a good death in Japan.

Appendix

Good Death Inventory (GDI)

How do you think the patient felt during the end-of-life period? Please check the appropriate number. 1: absolutely disagree, 2: disagree, 3: somewhat disagree, 4: unsure, 5: somewhat agree, 6: agree, 7: absolutely agree.

I. Physical and psychological comfort

- Patient was free from pain.
- Patient was free from physical distress.
- Patient was free from emotional distress.

II. Dying in a favorite place

- Patient was able to stay at his or her favorite place.
- Patient was able to die at his or her favorite place.
- The place of death met the preference of the patient.

III. Maintaining hope and pleasure

- Patient lived positively.
- Patient had some pleasure in daily life.
- Patient lived in hope.

IV. Good relationship with medical staff

- Patient trusted the physician.
- Patient had a professional nurse with whom he or she felt comfortable.
- Patient had people who listened.

V. Not being a burden to others

- Patient was not being a burden to others. (*)
- Patient was not being a burden to family members. (*)
- Patient had no financial worries. (*)

VI. Good relationship with family

- Patient had family support.
- Patient spent enough time with his or her family.
- Patient had family to whom he or she could express feelings.

VII. Independence

- Patient was independent in moving or waking up.
- Patient was independent in daily activities.
- Patient was not troubled with excretion.

- VIII. Environmental comfort
 Patient lived in quiet circumstances.
 Patient lived in calm circumstances.
 Patient was not troubled by other people.
- IX. Being respected as an individual
 Patient was not treated as an object or a child.
 Patient was respected for his or her values.
 Patient was valued as a person.
- X. Life completion
 Patient had no regrets.
 Patient felt that his or her life was completed.
 Patient felt that his or her life was fulfilling.
- XI. Receiving enough treatment
 Patient received enough treatment.
 Patient believed that all available treatments were used.
 Patient fought against disease until the last moment.
- XII. Natural death
 Patient was not connected to medical instruments or tubes.
 Patient did not receive excessive treatment.
 Patient died a natural death.
- XIII. Preparation for death
 Patient met people whom he or she wanted to see.
 Patient felt thankful to people.
 Patient was able to say what he or she wanted to dear people.
- XIV. Control over the future
 Patient knew how long he or she was expected to live.
 Patient knew what to expect about his or her condition in the future.
 Patient participated in decisions about treatment strategy.
- XV. Unawareness of death
 Patient died without awareness that he or she was dying.
 Patient lived as usual without thinking about death.
 Patient was not informed of bad news.
- XVI. Pride and beauty
 Patient felt burden of a change in his or her appearance. (*)
 Patient felt burden of receiving pity from others. (*)
 Patient felt burden of exposing his or her physical and mental weakness to family. (*)
- XVII. Feeling that one's life is worth living
 Patient felt that he or she could contribute to others.
 Patient felt that his or her life is worth living.
 Patient maintained his or her role in family or occupation.
- XVIII. Religious and spiritual comfort
 Patient was supported by religion.
 Patient had faith.
 Patient felt that he or she was protected by a higher power.
 (*) Inverse items

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Reliability Assessment and Findings of a Newly Developed Quality Measurement Instrument: Quality Indicators of End-of-Life Cancer Care from Medical Chart Review at a Japanese Regional Cancer Center

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ABSTRACT

Objectives: To assess the reliability of quality indicators of end-of-life cancer care (QI-EOL) and evaluate the quality of end-of-life cancer care in general wards by using QI-EOL.

Methods: A retrospective chart review study was conducted on patients with cancer who died in general wards ($n = 104$) and the palliative care unit (PCU; $n = 200$) between September 2004 and February 2006 at a regional cancer center in Japan. Herein, we measured QI-EOL, which was developed to evaluate the quality of end-of-life cancer care based on medical charts. We preliminarily assessed the interrater reliability of QI-EOL and subsequently compared the percentages of QI-EOL documented between settings.

Results: The reliability of QI-EOL was assured in 27 of 29 indicators ($\kappa > 0.40$ or agreement $> 90\%$). For the reliable indicators, we found wide variation in the percentages of QI-EOL documented, ranging from 0% to 98% in general wards. Thirteen of 27 indicators were significantly less documented in general wards than in PCU. Presence of delirium or agitation was less documented (15% in general wards, 55% in PCU, $p < 0.001$), although presence of pain (92%, 93%, $p = 1.000$) and dyspnea (78%, 78%, $p = 1.000$) were similarly documented. Observation and oral care (22%, 62%, $p < 0.001$) differed significantly. Patient's (29%, 45%, $p = 0.009$) and family's (30%, 45%, $p = 0.014$) preferred place of care were infrequently documented. For psychosocial and spiritual concerns, no significant differences were found.

Conclusion: QI-EOL is generally a reliable quality measure instrument. We found the need for improvements of end-of-life cancer care in general wards using the QI-EOL.

INTRODUCTION

MEASURING THE QUALITY OF CARE is an important issue for monitoring clinical practice and improving outcomes.¹⁻³ Although patient assessment is

the best quality measure, it is impractical to measure the quality of end-of-life care because of the difficulties of accurate prognostication for end-of-life and many patients are too ill to provide assessments.⁴ In contrast, several recent studies developed quality in-

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dicators (QIs) of palliative and end-of-life care, which assess the quality from existing sources such as administrative data or medical chart data.⁵⁻¹¹

Earle et al.⁵ identified QIs of end-of-life cancer care using administrative data that focused on the aggressiveness of care. In the United States, they analyzed Medicare claims and the Surveillance, Epidemiology and End Results registries between 1993 and 1996 and found that, near death, there were trends associated with increased chemotherapy uses, emergency department visits, hospitalizations, and intensive care unit (ICU) admissions.¹² Barbera et al.¹³ also reported on the poor quality of end-of-life cancer care using the Ontario Cancer Registry. However, databases do not include some important information such as psychosocial care, pain and symptom management, and advance directives.⁶ QIs from administrative data have the advantage of being readily available and inexpensive to collect, but they may be unreliable and lack detail.¹⁴⁻¹⁶

The Assessing Care of Vulnerable Elders (ACOVE) project developed a quality assessment system using the medical chart.¹⁷ The ACOVE QI set consisted of 22 conditions, including 14 indicators for end-of-life care such as surrogate decision makers, advance directives, care preferences, and symptom management.⁷ Wenger et al.¹⁸ measured the ACOVE QI set for vulnerable community-dwelling older patients in two managed care organizations in the United States. They reported wide variation in documentation of QIs among conditions from end-of-life care (9%) to stroke care (82%). Twaddle et al.⁹ developed 11 key performance measures to assess the quality of hospital-based palliative care and reported wide variability of palliative care in 35 teaching hospitals across the United States from retrospective chart reviews. Clark et al.¹⁰ identified QIs of end-of-life care in the ICU, and reported better practice in symptom management but inadequacies in spiritual support, communication, emotional support, and continuity of care in 15 ICUs.

In Japan, palliative care developed from inpatient care for terminal cancer patients in palliative care units (PCUs). In 1990, coverage of PCU was included in National Health Insurance and the number of PCUs has increased from 5 to 177 in 2007. Nevertheless, only 6% of all patients with cancer died in the PCU, while most (91%) died in the hospital in 2006.²⁰ In addition, interdisciplinary palliative care teams (PCTs) provide specialized palliative care in general wards in cooperation with attending physicians. These teams are still developing. Therefore, measuring the quality of end-of-life care in general wards is an important task to improve care for dying patients with cancer in Japan.

In Japan, using administrative data is difficult because the cancer registry is insufficient and medical claims are inaccessible. Additionally, the Japanese concept of quality of end-of-life is marginally different from Western countries.^{21,22} For these reasons QIs of end-of-life cancer care (QI-EOL) from medical chart review have been identified by using the consensus method in Japan.²³ QI-EOL consists of 30 indicators, which assess symptom control, decision making and preference of care, family care, and psychosocial and spiritual concerns. In order to offer valuable insights from the newly developed QI-EOL, these indicators must be reliable.^{15,16,24,25} Therefore, the purpose of this study was to assess the reliability of QI-EOL and evaluate the quality of end-of-life cancer care in general wards by applying QI-EOL.

METHODS

Study design

We conducted a chart review study in order to measure QI-EOL and evaluate the quality of end-of-life cancer care. Data were collected retrospectively on cancer patients who died in general wards and the PCU from September 2004 to February 2006 at a regional cancer center (Tsukuba Medical Center Hospital). This center has 409 beds, including 20 PCU beds, and plays a central role in cancer treatment, community health care and emergency medical care in Ibaraki prefecture, Japan. The inclusion criteria were as follows: died from cancer; aged 20 years or older at the time of death; and hospitalized for 3 days or more. The cancer sites could not be matched between settings due to the inclusion of data from various clinical departments, including respiratory medicine, general thoracic surgery, gastroenterology, gastroenterological surgery, general medicine, and palliative medicine. During the study period, these departments represented 88% of all cancer deaths in general wards and 100% of all deaths in the PCU.

The Japanese ethical guidelines for epidemiologic research restricts access to medical charts without disclosure of information to participants and a guarantee of their right to refuse participation.²⁶ Therefore, we mailed a letter to the bereaved families to inform them about the study and reviewed the medical charts for the patients whose bereaved families did not decline to participate. A qualified research nurse (K.S.) reviewed all medical charts under the supervision of a PCU doctor (S.Y.). An additional abstractor (M.M., also a research nurse) independently and randomly reviewed 10% of medical charts to assess interrater re-

liability. The abstracters were trained using abstraction guidelines with detailed definitions. The ethics committee of Tsukuba Medical Center Hospital approved the protocol of this study.

Measures

QI-EOL was developed in order to evaluate the quality of end-of-life cancer care based on medical chart review using the modified Delphi method. The development methods were previously described in detail.²³ Briefly, 96 potential indicators were proposed from a combination of systematic reviews and expert judgment. An expert panel comprised of 17 multiprofessional specialists, 5 palliative care physicians, a medical oncologist, a general medicine physician, 3 psycho-oncologists, 3 nurses, 2 sociologists, a medical ethicist, and an expert on Delphi methodology, rated potential indicators for appropriateness of quality end-of-life cancer care and feasibility for extraction from

medical chart review. Through 2 expert panels, 30 indicators within 4 domains were accepted, which included 8 indicators for symptom control, 5 for decision-making and preference of care, 11 for family care, and 6 for psychological and spiritual concerns. Because QI-EOL focus on the documentation of a general approach (e.g., documentation of the degree of pain) to care rather than practical action (e.g., documenting the degree of pain on a 0–10 numeric rating scale more than once a day), a set of abstraction guidelines was developed for the present study in cooperation with QI-EOL developers. An additional expert panel reviewed the guidelines and deleted or modified unmeasurable indicators from medical charts and divided the indicators with double-barreled questions. Finally, we used the modified QI-EOL as follows: 10 indicators focused on symptom control, 6 focused on decision-making and preference of care, 9 focused on family care, and 4 focused on psychological and spiritual concerns (Table 1). The patients who died were

TABLE 1. INTERRATER RELIABILITY OF QUALITY INDICATORS OF END-OF-LIFE CANCER CARE

	Agreement (%)	κ coefficient
Symptom control		
Presence or absence of pain	93	0.47
Degree of pain	80	0.53
Physician's prescription order for pain management	87	0.59
Physician's prescription order for first and second line pain management	90	0.80
Presence or absence of dyspnea	97	0.84
Physician's prescription order for dyspnea	80	0.59
Effect of rescue medication for any physical distress	90	0.63
Presence or absence of delirium or agitation	90	0.73
Physician's prescription order for delirium or agitation	90	0.79
Observation and care of mouth	77	0.54
Decision-making and preference of care		
Patient's preferred place of care	77	0.53
Patient's insight of disease	83	0.56
Explanation of medical condition to patient	83	0.65
Discussion with patient about goals of care	77	0.48
Discussion with patient about do-not-resuscitate order	97	0.65
Discussion of strategy of care among physicians and nurses	70	0.30
Family care		
Configuration of family relationships	97	0.65
Key person involved in patient care	97	0.65
Family's preferred place of care	77	0.52
Family's insight of disease	93	-0.03
Explanation of medical condition to family	100	1.00
Family's preferences or expectations	87	0.63
Discussion with family about goals of care	93	0.46
Discussion with family about do-not-resuscitate order	97	0.78
Explanation to family of patient's impending death	97	0.65
Psychosocial and spiritual concerns		
Degree and content of patient's anxiety	77	0.52
Patient's religion	83	0.66
Patient's preferences or expectations	80	0.53
Patient's preference for bowel and bladder excretion	63	0.22

Agreement between two different abstracters of 30 randomly selected medical chart reviews.

retrospectively identified (denominators) and inpatient medical charts were reviewed to clarify whether each indicator was documented on admission or within the last 2 weeks of the hospitalization (numerators). High percentages of documented QI-EOL indicated high quality of end-of-life cancer care.

Furthermore, data on patients' demographic and clinical characteristics were collected. Demographic characteristics included gender and age. Clinical characteristics included primary cancer site, stage, treatment (surgery, chemotherapy and radiotherapy), length of time since cancer diagnosis, hospital stay and PCU stay, documentation of do-not-resuscitate (DNR) order, patient or family consent to DNR, and length of time between documentation and death.

Statistical analysis

Initially, to test interrater reliability, we calculated the agreement and κ coefficient of QI-EOL between two abstractors. According to the criteria of Landis and Koch, agreement was classified according to κ scores as poor (0–0.20), fair (0.21–0.40), moderate (0.41–0.60), substantial (0.61–0.80), and almost perfect (0.81–1.0).²⁷ We defined an indicator as reliable if κ was > 0.40 . Meanwhile, in a 2×2 table showing binary agreement of two observers, κ becomes unreliable when the distribution of the dichotomous variable is unbalanced; therefore, despite the high level of agreement, kappa would be very low.²⁸ Thus, we also defined an indicator as reliable if agreement was greater than 90% when κ was ≤ 0.40 .

Next, for the reliable indicators, we showed the percentages of QI-EOL documented separately from general wards and PCU. As PCU is the current gold standard for end-of-life care in Japan, bivariate analyses between settings were then conducted to assess the quality of end-of-life cancer care in general wards. For patients' demographic and clinical characteristics, percentages were calculated for categorical variables and the median, mean and standard deviation (SD) were calculated for quantitative variables. These characteristics were compared between settings and statistically were analyzed using Fisher's exact test, the Cochran-Armitage exact trend test, or the Wilcoxon test, when appropriate. A p value of < 0.05 was considered statistically significant. All statistical analyses were performed with SAS version 9.1 for windows (SAS Institute, Cary, NC).

RESULTS

Patients

During the study period, patients who died in general wards ($n = 160$) and PCU ($n = 228$) were iden-

tified as potential subjects meeting the inclusion criteria. Among potential subjects, 44 were excluded due to participation in the other study ($n = 23$ in general wards, $n = 0$ in PCU), serious psychological distress as determined by the attending physician ($n = 8$, $n = 0$), treatment or injury related deaths ($n = 3$, $n = 1$), no bereaved adult members ($n = 2$, $n = 2$) or other reasons ($n = 4$, $n = 1$). Subjects were also excluded because the bereaved families had no known addresses ($n = 3$, $n = 8$) or declined to participate ($n = 13$, $n = 15$) and one medical chart was missing in the PCU. Finally, we completed medical chart review for 104 (66%) and 200 (88%) patients.

Patient demographic and clinical characteristics are shown in Table 2. Among the patients whose medical charts were reviewed, 71% and 55% were male and mean age was 71 ± 9 and 68 ± 12 years old in general wards and PCU, respectively. Primary cancer sites were lung (41% in general wards, 15% in PCU), hepatobiliary and pancreatic (28%, 17%) and gastric (11%, 16%). Most patients (94%, 97%) had DNR orders and families, not patients, generally have consent (97%, 97%). Comparing general wards with PCU, there were significantly more males ($p = 0.007$), primary cancer sites were different ($p < 0.001$), cancer stages were less advanced ($p = 0.002$), experience of surgery ($p < 0.001$) or chemotherapy ($p = 0.014$) were less and lengths between cancer diagnosis and death ($p < 0.001$) were shorter.

Reliability of QIs

Agreement and κ for two abstractors of 30 randomly selected medical chart reviews are shown in Table 1. κ of three indicators was ≤ 0.40 and two agreements of those indicators were also $\leq 90\%$. "Discussion of strategy of care among physicians and nurse" (agreement, 70%; κ , 0.30) and "patient's preference for bowel and bladder excretion" (agreement, 63%; κ , 0.22) had poor interrater reliability in this study. These two indicators were excluded from the following results.

Quality of end-of-life cancer care

Documentation of QI-EOL is shown in Table 3. For symptom control, percentages of QI-EOL documented in general wards were from 15% (presence or absence of delirium or agitation) to 92% (presence or absence of pain). By comparing general wards to PCU, 5 of 10 indicators were significantly less documented and one was more frequently.

For decision-making and preference of care, percentages of QI-EOL documented in general wards were from 0% (discussion with patient about DNR or

TABLE 2. PATIENT DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

	General wards (n = 104)		Palliative care unit (n = 201)		p
	n	(%)	n	(%)	
Gender, male	74	(71)	110	(55)	0.007 ^a
Age, years (Mean \pm SD)	71 \pm 9		68 \pm 12		0.100
Primary cancer site					
Lung	43	(41)	30	(15)	<0.0001 ^b
Hepatobiliary and pancreatic	29	(28)	34	(17)	
Gastric	11	(11)	32	(16)	
Colorectal	7	(6.7)	35	(17)	
Head and neck	0	(0)	16	(8.0)	
Breast	1	(1.0)	15	(7.5)	
Other	13	(13)	39	(19)	
Cancer stage					
Local	7	(6.7)	2	(1.0)	0.002 ^a
Regional	19	(18)	26	(13)	
Distant	74	(71)	171	(85)	
Experience of cancer treatment					
Surgery	26	(25)	118	(59)	<0.0001 ^b
Chemotherapy	52	(50)	131	(65)	
Radiotherapy	45	(43)	93	(46)	
Length between cancer diagnosis and death, months (median, mean \pm SD)	7,	14 \pm 27	18,	32 \pm 39	<0.0001 ^b
Length of hospital stay, (median, mean \pm SD)	27,	37 \pm 37	30,	45 \pm 65	0.296
Length of palliative care unit stay, days (median, mean \pm SD)	—	—	23,	37 \pm 60	—
Documentation of DNR order	98	(94)	197	(98)	0.067
DNR order consented by family, not patient	95	(97)	192	(97)	0.307
Length of time between written DNR order and death, days (median, mean \pm SD)	8,	17 \pm 29	7,	20 \pm 55	0.893

^a $p < 0.01$, ^b $p < 0.001$, ^c $p < 0.05$.

Several total percentages are not 100% due to missing values.
DNR, do-not-resuscitate; SD, standard deviation.

der) to 56% (patient's insight of disease). Two of 5 indicators were significantly less documented in general wards than PCU.

For family care, percentages of QI-EOL documented in general wards were from 30% (family's preference of place of care) to 98% (key person involved in patient care). Six of 9 indicators were significantly less documented in general wards than PCU.

For psychosocial and spiritual concerns, percentages of QI-EOL documented in general wards were documented from 34% (degree and content of patient's anxiety) to 65% (patient's preferences or expectations). No significant differences were seen between settings.

DISCUSSION

We preliminarily assessed the interrater reliability of QI-EOL and affirmed that many indicators had moderate or substantial interrater reliability.

Subsequently, we found several features and concerns about current clinical practice for dying cancer patients by measuring the reliable QIs. Many indicators were less documented in general wards than PCU. Our findings indicated the need for improvements in assessment of delirium, mouth care and discussion about preferred place of care. Despite their importance in end-of-life care, these aspects were not well assessed by previous QIs.⁵⁻¹¹ QI-EOL is a useful instrument to assess the quality of end-of-life cancer care, which has comprehensive concepts and methodological advantages such as relative ease and fewer difficulties with measurement.

For symptom control, assessment of delirium was insufficient in general wards. Presence of delirium or agitation was documented 15% in general wards, although delirium was observed in 63%-90% of patients with cancer prior to death.²⁹⁻³¹ While nurses should play a key role in recognition of delirium, delirium was often unrecognized by nurses.³² When terminally ill patients with cancer experienced delirium, families

TABLE 3. DOCUMENTATION OF QUALITY INDICATORS OF END-OF-LIFE CANCER CARE IN GENERAL WARDS AND PALLIATIVE CARE UNIT

	General wards (n = 104)		Palliative care unit (n = 201)		p
	n	(%)	n	(%)	
Symptom control					
Presence or absence of pain	96	(92)	185	(93)	1.000
Degree of pain	57	(55)	119	(60)	0.464
Physician's prescription order for pain management	79	(76)	174	(87)	0.023 ^a
Physician's prescription order for first and second line pain management	62	(60)	88	(44)	0.011 ^a
Effect of rescue medication for any physical distress ^d	52	(73)	162	(92)	<0.0001 ^b
Presence or absence of dyspnea	81	(78)	155	(78)	1.000
Physician's prescription order for dyspnea	39	(38)	86	(43)	0.391
Presence or absence of delirium or agitation	16	(15)	109	(55)	<0.0001 ^b
Physician's prescription order for delirium or agitation	31	(30)	109	(55)	<0.0001 ^b
Observation and care of mouth	23	(22)	124	(62)	<0.0001 ^b
Decision-making and preference of care					
Patient's preferred place of care	30	(29)	89	(45)	0.009 ^c
Patient's insight of disease	58	(56)	144	(72)	0.005 ^c
Explanation of medical condition to patient	18	(17)	48	(24)	0.191
Discussion with patient about goals of care	18	(17)	42	(21)	0.453
Discussion with patient about do-not-resuscitate order	0	(0)	4	(2.0)	0.303
Family care					
Configuration of family relationships	100	(96)	198	(99)	0.186
Key person involved in patient care	102	(98)	195	(98)	1.000
Family's preferred place of care	31	(30)	89	(45)	0.014 ^a
Family's insight of disease	78	(75)	195	(98)	<0.0001 ^b
Explanation of medical condition to family	98	(94)	199	(100)	0.007 ^c
Family's preferences or expectations	66	(63)	170	(85)	<0.0001 ^b
Discussion with family about goals of care	87	(84)	185	(93)	0.029 ^a
Discussion with family about do-not-resuscitate order	79	(76)	168	(84)	0.091
Explanation to family of patient's impending death	88	(85)	185	(93)	0.044 ^a
Psychosocial and spiritual concerns					
Degree and content of patient's anxiety	35	(34)	91	(46)	0.050
Patient's religion	66	(63)	116	(58)	0.389
Patient's preferences or expectations	68	(65)	144	(72)	0.239

^a $p < 0.05$, ^b $p < 0.001$, ^c $p < 0.01$.

^dPercentages were calculated from patients with rescue medication (71 in general wards, 176 in palliative care unit). Whether each indicator was documented in inpatient medical charts on admission or within the last 2 weeks of life.

experienced high levels of distress³³; therefore, appropriate assessment and treatment of delirium are needed to reduce patients' and families' distress. Second, mouth care was also insufficient in general wards. Dry mouth is a common symptom observed in 60%–70% of patients with cancer prior to death.^{34,35} Good nursing care can relieve this distressing symptom,³⁶ so nurses should document assessment and care of the mouth to provide continued care and symptom relief. Third, assessment of pain and dyspnea was relatively well documented but minor improvements could be made in the management of physical symptoms. Twaddle et al. measured the quality of palliative care for patients with cancer in 35 teaching hospitals using medical chart review and reported assessment of pain (98%) with a numeric pain scale (82%) and dys-

pnea (90%).⁹ Our results for assessment of pain (92%), degree of pain (55%), and dyspnea (78%) in general wards were common with PCU but less than in the United States. In addition, effect of rescue medication in general wards (73%) was documented less than PCU (92%). Assessment and management of physical symptoms have room for improvement.

For decision making and preference of care, many indicators were relatively less documented in both settings. This indicated the possibility of poor advanced communication with patients. Several studies indicated that in Japan the preference of families, not patients, determines the end-of-life decision-making more than in Western countries.^{37–39} Furthermore, many patients lost communication capacity in the last two weeks due to decreased consciousness, appearance

of delirium or induction of palliative sedation.^{29-31,40} For these reasons, discussion with patients about their illness and preference were avoided by health care professionals and sometimes impossible because of the patient's condition.

For family care, the family's preferred place of care was documented remarkably infrequently. The multicenter survey in Japan revealed that half of the bereaved families of patients with cancer considered the referrals to PCU to have been too late and such family-perceived late referrals were associated with insufficient discussion with physicians about preferred end-of-life care.⁴¹ Short length of stay in hospice was associated with lower satisfaction of care,^{42,43} therefore, health care professionals in general wards may improve the quality of end-of-life cancer care by discussing preferred place of care earlier and more frequently. Meanwhile, the other indicators were well documented, although less frequently than PCU. This indicated the good advanced communication with families, whereas the frequency of family consented DNR orders (97%) may improve the apparent percentages.

For psychosocial and spiritual concerns, no significant differences were detected, although these concepts are central to palliative care. We propose two reasons for this gap. In Japan, compared to Western countries, patients with cancer view religious support as less important.^{21,22} In addition, religious or spiritual care was sometimes not provided even if was considered important.⁴⁴ The study PCU did not provide chaplain care; psychosocial and spiritual care may be insufficient even in PCU. However, these indicators may not be sensitive enough to detect changes.

This study has several limitations. First, documentation in medical charts may not reflect actual practice. However, documentation itself is also important in the sharing of information and ongoing assessment; therefore, QI-EOL was developed for assess the quality by focusing on documentation. Second, interrater reliability of many indicators was moderate (κ , 0.41-0.60). Stricter guidelines and training of abstracters is necessary to further enhance the reliability. With regards to this study, the results were reliable for a single abstractor who reviewed all medical charts. In addition, QI-EOL focused on general approach to care rather than practical action. This ambiguity complicated the measurement process and resulted in the modification of the original indicators in order to establish more feasible indicators. Third, this study was conducted in a single center. Extrapolation of our findings is difficult, so further multicenter studies are necessary to assess the quality of end-of-life cancer care in Japan. Moreover, this study could not include all

potential subjects due to strict adherence to ethical guidelines. Families of patients who received poor quality end-of-life care may be more likely to decline to participate in such a study; therefore, the differences between settings may have been underestimated. Despite the limited sample, we do not believe that the results have been significantly effected. Fourth, QI-EOL was developed by expert panels that did not include patients or family members; thus, QI-EOL may have poor content validity. Finally, the number of nurses and some characteristics of patients are different between general wards and PCUs. The difference between settings may be overestimated.

CONCLUSIONS

We initially found that QI-EOL was a generally reliable quality measure instrument. Subsequently, using QI-EOL, we found that the quality of end-of-life cancer care was less adequate in general wards when compared to that provided in PCU. In particular, our findings indicated the need for improvements in assessment of delirium, oral care, and discussion about preferred place of care. Educational intervention focusing on these perspectives could improve the clinical practice for dying patients with cancer in general wards.

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Negative psychological aspects and survival in lung cancer patients

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Abstract

We conducted a prospective cohort study in Japan to investigate associations between negative psychological aspects and cancer survival. Between July 1999 and July 2004, a total of 1178 lung cancer patients were enrolled. The questionnaire asked about socioeconomic variables, smoking status, clinical symptoms, and psychological aspects after diagnosis. Negative psychological aspects were assessed for the subscales of helplessness/hopelessness and depression. Clinical stage, performance status (PS), and histologic type were obtained from medical charts. The subjects were followed up until December 2004, and 686 had died. A Cox regression model was used to estimate the hazards ratio (HR) of all-cause mortality. After adjustment for socioeconomic variables and smoking status in addition to sex, age, and histologic type, both helplessness/hopelessness and depression subscales showed significant linear positive associations with the risk of mortality (p for trend < 0.001 for both). However, after adjustment for clinical state variables in addition to sex, age, and histologic type, these significant linear positive associations were no longer observed (p for trend = 0.41 and 0.26, respectively). Our data supported the hypothesis that the association between helplessness/hopelessness and depression and the risk of mortality among lung cancer patients was largely confounded by clinical state variables including clinical stage, PS, and clinical symptoms.

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Introduction

Negative psychological aspects, including depression, are common among cancer patients [1]. It has been reported that between 8% [2] and 44% [3] of lung cancer patients suffer from depression [2–7]. Furthermore, it has been suggested that negative psychological aspects affect the prognosis [8–14] as well as the quality of life of lung cancer patients [6,15,16].

In a recent review of studies that investigated the associations between the psychological aspects and the risk of mortality in cancer patients [17], it was revealed that helplessness/hopelessness [8,9] and depression [11,14] affected the mortality risk in cancer patients. It has been hypothesized that negative psychological aspects might affect the risk of mortality in cancer patients via endocrinological and/or immunological pathways [18,19] or poor compliance with cancer treatment [20].

Another possible interpretation of the increased mortality observed in cancer patients with negative

psychological aspects is that the negative psychological aspects may simply reflect a poor clinical state, which by itself would be associated with an increased mortality in cancer patients. Depression has been reported to be strongly associated with poor clinical state such as the tumor stage, performance status (PS), and severity of clinical symptoms [7,21]. In addition, the severity of clinical symptoms, such as pain and dyspnea, was shown to be an important independent prognostic factor in a population with lung cancer patients [22,23]. The clinical state indices are thus important confounders that must be taken into account in the evaluation of the association between negative psychological aspects and the risk of mortality among cancer patients. Most previous studies suggesting the existence of the above association had a limitation in that they failed to sufficiently control for the effect of the clinical state of the patients [10–16].

The purpose of this study was to test the hypothesis that the association between the nega-

tive psychological aspects and the risk of mortality among lung cancer patients is confounded by the poor clinical state of the patients. If this hypothesis were proved, it would reassure cancer patients because poor psychological states in cancer patients may merely be a consequence of illness but not a determinant of poor prognosis. In order to test the hypothesis, we conducted a prospective cohort study using the Lung Cancer Database Project (LCDP) at the National Cancer Center Hospital East (NCCHE), Japan. This study has enrolled the largest number of subjects ($N = 1178$), recorded the largest number of deaths ($N = 686$), and had the longest follow-up periods (29 063 person-months) of all studies to date and also extensively controlled for possible confounders, including the clinical states, socioeconomic variables, and the smoking status.

Methods

Study participants

The study design has been reported in detail elsewhere [24]. Briefly, these data were derived from the LCDP at the NCCHE, Japan. The inclusion criteria of the patients were newly diagnosed as lung cancer from July 1999 through July 2004 at the NCCHE. We invited 2036 consecutive patients who participated in the LCDP. Of those, 1995 patients gave their consent. Three psychological questionnaires, namely, the Eysenck Personality Questionnaire-Revised (EPQ-R) [25], the Mental Adjustment to Cancer Scale (MACS) [26], and the Hospital Anxiety and Depression Scale (HADS) [27] were distributed to the subjects. Because we had discontinued the above psychological questionnaire surveys in August 2003 for non-academic reasons, 414 patients who entered the LCDP after August 2003 were ineligible for the present study. Consequently, 1581 patients were included for the analysis in this study. We excluded patients with: (1) concomitant cancer ($n = 39$), (2) duplicate cancer ($n = 149$), and (3) responses missing for any of the items related to the subscales of this study (neuroticism, helplessness/hopelessness, and depression) ($n = 215$). Finally, we analyzed 1178 patients with lung cancer for this study. The patients completed the questionnaires by themselves at home before admission.

The characteristics of the patients who were included in this study (1178 patients) or excluded (403 patients) from this study were similar (mean age at diagnosis in years, 64 vs 66; women, 29 vs 28%; clinical stage, IA–IIB 44 vs 45%, IIIA–IIIB 30 vs 25%, and IV 27 vs 28%; PS, PS0 41 vs 47%, and PS \geq 1 59 vs 53%, respectively).

The questionnaire also included questions pertaining to socioeconomic variables, smoking status,

clinical state, and the psychological aspects of the patients.

Medical information about the patients was obtained from the patients' medical charts. A trained research nurse (KS-N) who was blinded to the outcome of the individual patients conducted a chart review to extract the histologic type, clinical stage, PS, and severity of self-reported pain and dyspnea.

All patients provided their written informed consent. The project was approved by the Institutional Review Board and the Ethics Committee of the National Cancer Center, Japan (in March 1999).

Socioeconomic variables, smoking, and the clinical state

Information, including the age at diagnosis, sex, socioeconomic variables (educational level, marital status, and cohabitation), smoking status, and severity of clinical symptoms (self-reported pain and dyspnea), was obtained from the self-administered questionnaires.

Medical information, including the clinical stage, PS, or histologic type, was obtained from the patients' medical charts. The clinical stage of lung cancer was classified according to the TNM classification of the International Union Against Cancer. The PS was assessed by the attending physician of each patient using the Eastern Cooperative Oncology Group criteria [28]. Self-reported pain and dyspnea at the time of diagnosis were self-graded on a four-point scale: 1 (none), 2 (mild), 3 (moderate), 4 (severe), or 5 (very severe) [2].

Negative psychological aspects

Neuroticism

The personality trait of the neuroticism subscale was measured with the Japanese version of EPQ-R [25,29]. The subscale contains 12 questions with dichotomized responses (yes or no), with the total scores for the items ranging from 0 to 12. Higher scores indicate a greater tendency toward emotional instability.

Helplessness/hopelessness

The coping style of the helplessness/hopelessness subscale was measured with the Japanese version of MACS [26,30]. The subscale contains six questions, each question rated on a scale of 1 (definitely does not apply to me) to 4 (definitely applies to me). Higher scores indicate a greater tendency of the patients toward exhibiting a feeling of hopelessness and helplessness about themselves and their future because of having cancer, with a wholly pessimistic attitude.

Depression

Depressive symptoms were measured using the Japanese version of HADS [27,31]. The subscale contains seven questions, and each question is rated on a four-point scale of 0–3. Higher scores indicate greater depressive symptoms.

Follow-up

Survival until December 31, 2004, was confirmed by referring to the medical records, by mailing the patients, or from the annual residential registry, every year by members of our co-medical staff at the Division of Thoracic Oncology and the Psycho-Oncology Division. None of the subjects was lost to follow-up during the study period.

The person-months of follow-up were counted for each subject, from the date of the first visit to the NCCHE until the date of death or December 31, 2004, whichever occurred first. We accrued a total of 29 063 person-months and documented 686 deaths. However, we had no information on the cause of death.

Statistical analyses

The scores for each of the psychological subscales of neuroticism, helplessness/hopelessness, and depression were divided into four score levels approximately equal in size (quartiles) based on the scores of the subjects as a whole. Hazard ratios (HRs) were computed as the death rate among the subjects in each score level of the psychological subscale divided by the death rate among the subjects in the lowest score level. We used Cox proportional hazards regression to adjust for sex, age, and other potentially confounding variables [32] using the SAS PHREG program on the SAS statistical software package, version 9.1 (Cary, NC, USA). *p* Values for testing the statistical significance of the linear trends were calculated by treating the scores of each subscale as a continuous variable. *p* Values of less than 0.05 were considered to be statistically significant. All *p* Values were two-tailed.

We performed three multivariate analyses. Model 1 was adjusted for socioeconomic variables and smoking status as follows: educational level (high school or lower or higher) marital status (married, unmarried), cohabitation (living alone, living with someone), and smoking status (never smoker, ex-smoker, current smoker of 1–19 cigarettes per day, current smoker of 20 or more cigarettes per day) in addition to the age at diagnosis (continuous variable), sex, and histologic type (adenocarcinoma, squamous cell carcinoma, small cell carcinoma, large cell carcinoma, other). Model 2 was adjusted for clinical state variables as follows: clinical stage (IA–IIB, IIIA–IIIB, IV) and PS (0 or

1 ≤) in addition to the age at diagnosis, sex, and histologic type. Model 3 was adjusted for the clinical state variables, severity of self-reported pain, and dyspnea (none to mild or moderate to very severe) in addition to the factors adjusted for in model 2. For all models, the proportional hazard assumptions were tested and met.

Results

A total of 1178 lung cancer patients were enrolled in the study. The mean age of the patients was 64 years (SD 9) and 29% were women. Adenocarcinoma was the most common (58%), followed by squamous cell carcinoma (19%), small cell carcinoma (12%), large cell carcinoma (9%), and others (2%). As for the clinical stage, stage IA–IIB was the most common (36%), followed by stage IIIA–IIIB (30%), stage IV (27%), and stage IIA–IIB (7%). As for PS, PS1 was the most common (53%), followed by PS0 (41%), PS2 (5%), and PS3 (1%).

Table 1 shows a comparison of the characteristics of the subjects between the highest and lowest score categories (divided into approximate quartiles) for each of the subscales of neuroticism, helplessness/hopelessness, and depression. Subjects with higher scores on the neuroticism subscale were more likely to be unmarried and to have a higher severity of pain and dyspnea. Subjects with higher scores on the helplessness/hopelessness subscale were more likely to be older and to have squamous cell carcinoma, more advanced cancer, poorer PS, and a higher severity of pain and dyspnea, and they were less likely to have a higher educational level. Subjects with higher scores on the depression subscale were more likely to have more advanced cancer, poorer PS, and a higher severity of pain and dyspnea.

After controlling for age at cancer diagnosis, sex and six variables, namely, histologic type (small cell or large cell carcinoma), smoking status (ex-smokers, currently smoking 1–19 cigarettes per day, or currently smoking 20 or more cigarettes per day), clinical stage (IIIA–IIIB or IV), PS (1 ≤), self-reported pain (moderate to severe), and self-reported dyspnea (moderate to severe) were significantly positively associated with the risk of mortality among lung cancer patients as compared with that in each referent category (data not shown).

Neuroticism

For model 1, in which the estimated HR was adjusted for socioeconomic variables and the smoking status, we found no significant association between neuroticism and the risk of mortality in the lung cancer patients. The HR for the highest level of neuroticism vs that for the lowest level was