Appendix 1
Members of the Japanese Spiritual Care Task Force

Tatsuya Morita, MD, Seirei Mikatahara General Hospital
Yosuke Uchitomi, MD, PhD, Research Center for Innovative Oncology, National Cancer Center Hospital East
Terukazu Akazawa, Seirei Mikatahara General Hospital
Michiyo Ando, RN, PhD, St. Mary College
Chizuru Imura, RN, Japanese Nursing Association Center of Nursing Education and Research
Takuya Okamoto, MD, Eikoh Hospital
Masako Kawa, RN, PhD, The University of Tokyo
Yukie Kurihara, MSW, Shizuoka Cancer Center
Hirobumi Takenouchi, PhD, Shizuoka University
Shimon Tashiro, MA, Tohoku University
Kei Hirai, PhD, Osaka University
Yasuhiro Hirako, Soto Institute for Buddhist Studies
Hisayuki Murata, MA, Kyoto Notre Dame University
Tatsuo Akechi, MD, PhD, Nagoya City University Medical School
Nobuya Akizuki, MD, PhD, Research Center for Innovative Oncology, National Cancer Center Hospital East
Eisuke Matsushima, MD, PhD, Graduate School of Tokyo Medical and Dental University
Kazunari Abe, Chiba Cancer Center
Masayuki Ikenaga, MD, Yodogawa Christian Hospital
Taketoshi Ozawa, MD, Yokohama Kosei Hospital
Jun Kataoka, RN, Aichi Prefectural College of Nursing & Health
Akihiko Suga, MD, Sizuoka Prefectural Hospital
Chizuko Takigawa, MD, Keiyukai Sapporo Hospital
Keiko Tamura, Yodogawa Christian Hospital
Wataru Noguchi, MD, Graduate School of Tokyo Medical and Dental University
Etsuko Maeyama, RN, Department of Adult Nursing/Palliative Care Nursing, School of Health Sciences and Nursing, Graduate School of Medicine, The University of Tokyo
Eisho Yoshikawa, MD, PhD, Shizuoka Cancer Center

Appendix 2
Meaninglessness Intervention

I. Please answer the following questions concerning *your usual communication* with terminally ill cancer patients.

	Not at all	Rarely	Sometimes	Mostly	Always
I try to understand the patient's wishes.					
I try to know what is important to the patient.					
I try to know what makes the patient's life meaningful.					
I try to know what strengthens or weakens the meaning of life for the patient.					
I try to know what supports the patient's life from their words.					
I try to know what meaning the disease has for the patient.					

II. *To what degree of confidence can you communicate* with terminally ill cancer patients saying, "I can see no meaning in life"?

1. Totally unconfident	2. Unconfident	3. Moderately unconfident	4. Unsure	5. Moderately confident	6. Confident	7. Very confident

III. How do you feel if a terminally ill cancer patient tells you he/she "can see no meaning in life"?

I never do.	I do not.	I probably do not.	I am not sure.	I probably do.	I do.	I very much do.

I feel willing to do something to relieve the patient's suffering.

I think how I can support the patient effectively.

I wish to relieve the patient's suffering as much as possible.

I feel helplessness.

I feel like escaping.

I feel willing to be involved. (Reversed item)

I feel grateful that the patient has told it to me.

I feel that the patient trusts me.

original article

Preferences regarding end-of-life cancer care and associations with good-death concepts: a population-based survey in Japan

M. Sanjo[1]*, M. Miyashita[1], T. Morita[2], K. Hirai[3], M. Kawa[1], T. Akechi[4] & Y. Uchitomi[5]

[1]Department of Adult Nursing/Palliative Care Nursing, Health Sciences and Nursing, Graduate School of Medicine, The University of Tokyo; [2]Department of Palliative and supportive care, Palliative Care Team and Seirei Hospice, Seirei Mikatahara General Hospital, Hamamatsu, Shizuoka; [3]Center of the Study for Communication Design, Osaka University, Osaka; [4]Department of Psychiatry and Cognitive-Behavioral Medicine, Nagoya City University Graduate School of Medical Sciences, Nagoya; [5]Psycho-Oncology Division, Research Center for Innovative Oncology, National Cancer Center Hospital East, Chiba, Japan

Background: The aims of this study were to clarify end-of-life cancer care preferences and associations with good-death concepts.

Methods: The general population was sampled using a stratified random sampling method ($N = 2548$; response rate = 51%) and bereaved families from 12 certified palliative care units ('PCU-bereaved families') were surveyed ($N = 513$; response rate = 70%). The respondents reported their end-of-life care preferences and good-death concepts.

Results: Regarding place of end-of-life care, approximately 50% of the general population preferred 'Home', while 73% of PCU-bereaved families preferred 'PCU'. The concepts of 'Maintaining hope and pleasure' and 'Dying in a favorite place' were associated with the preference for 'Home'. Regarding prognostic disclosure, approximately 50% of the participants preferred some level of negotiation with the physician. The concept of 'Control over the future' was associated with this preference. Regarding treatment of severe refractory physical distress, 75% of the general population and 85% of the PCU-bereaved families preferred palliative sedation therapy. The concepts of 'Physical and psychological comfort' and 'Unawareness of death' were associated with this preference.

Conclusions: End-of-life care preferences were associated with good-death concepts. It would be useful for health-care workers to discuss patients' good-death concepts to support subsequent treatment decisions.

Key words: attitude towards death, palliative care, neoplasm, cross-sectional studies

introduction

An important goal of end-of-life care is to honor patients' preferences based on their concepts of 'quality of dying' and 'good death' [1, 2]. To date, researchers have explored such preferences with respect to three key issues: place of end-of-life care and death [3–6], prognostic disclosure [7–9] and terminal sedation and euthanasia for refractory suffering [10–12]. However, studies on preferences for discussing prognoses and treating severe refractory suffering using representative samples in Japan are lacking.

Although recent studies have suggested that a good death is the primary end-point of end-of-life care [13–15], the associations between end-of-life care preferences and good-death concepts are poorly understood. Research has focused on the concept of 'burden' [3, 16] or general beliefs about suffering

[16] without comprehensively conceptualizing these notions. Vig and colleagues [17] examined end-of-life preferences among geriatric outpatients in a preliminary quantitative study; however, quantitative associations between end-of-life care preferences and good-death concepts could not be identified from their data. As preferences for end-of-life care change with experience [18], it is essential to explore associations in individuals who have encountered bereavement and specialized palliative care. Our survey explored the associations between preferences and comprehensively conceptualized a good death in a representative sample of the Japanese population.

palliative-care system in Japan

The Japanese Ministry of Health, Labor and Welfare supports specialized palliative-care services, which have been covered by National Medical Insurance since 1991. Accordingly, the number of palliative care units (PCUs) increased from 5 in 1991 to 135 in 2004. To be approved as a PCU, institutions must fulfill requirements regarding staff numbers, facilities and

*Correspondence to: M. Sanjo, Department of Adult Nursing/Palliative Care Nursing, Graduate School of Medicine, The University of Tokyo, 7-3-1 Bunkyo-ku, Tokyo 113-0033, Japan. Tel: +81-3-5841-3508; Fax: +81-3-5841-3502; E-mail: shibagaki-tky@umin.ac.jp

equipment. PCUs with religious associations are sometimes called 'hospices', but both PCUs and hospices aim to provide intensive symptom control and end-of-life care for cancer patients and their families. Most PCUs belong to general hospitals, and have interdisciplinary teams including physicians, nurses and other specialists [19]. By comparison, the growth of home-based specialized palliative-care programs has been slow [20]. Palliative-care teams were not covered by National Medical Insurance until 2002, and remain in an early phase of development. The most common and best available palliative-care service in Japan remains the PCU, which is the subject of the present study.

materials and methods

study sample and procedures

This study was part of a nationwide survey, and the protocol has been described previously [21, 22]. We initially identified four target areas, in order to obtain a wide geographic distribution for the nationwide sample; these comprised an urban prefecture (Tokyo) and three mixed urban–rural areas (Miyagi, Shizuoka and Hiroshima).

A cross-sectional questionnaire was administered to nonbereaved members of the general population ('nonbereaved general population'), members of the general population who had been bereaved thorough cancer ('bereaved general population'), and bereaved family members of cancer patients who had died in 12 certified PCUs in Japan ('PCU-bereaved families').

We initially identified 5000 subjects within the general population (that is, the nonbereaved general population and the bereaved general population) using stratified two-stage random sampling of residents in the four areas. To identify bereaved family members, we initially identified all 37 PCUs in the four areas as potential participating institutions. We then approached the 18 PCUs with available collaborative researchers. Ultimately, 12 of the PCUs (two in Miyagi, five in Tokyo, two in Shizuoka, and three in Hiroshima) agreed to participate in the survey. Primary-care physicians identified bereaved families in which the caregiver fulfilled the following inclusion criteria: (i) primary caregiver of an adult cancer patient; (ii) aged 20 years or more; (iii) capable of replying to a self-reported questionnaire; (iv) aware of the diagnosis of malignancy; and (v) without serious psychological distress as determined by the physician.

We mailed self-reporting questionnaires to potential participants in August 2004, and re-sent them in October 2004 to those who did not respond; we requested that the primary caregiver filled in the questionnaire.

The protocol was approved by the institutional review board of each PCU, and conformed to the requirements of the Helsinki Declaration in respect to fully explaining the aims of the study, protecting the confidentiality of participants, ethical considerations and voluntary participation.

questionnaire

The questionnaire was designed based on an extensive literature review [3, 5, 7, 11, 13, 17, 23–32] and expert consensus (copies are available from the authors on request). Its feasibility and face validity were confirmed by a pilot study of a convenient sample of 54 members of the general population.

end-of-life care preferences

Respondents stated their preferences for the following aspects of end-of-life care in a scenario where they had incurable cancer. The questionnaire that was finally adopted is described in the Appendix.

place of end-of-life care and death. Respondents chose 'Home', 'Acute hospital' or 'PCU' as their desired place of care and place of death assuming they had a 1–2 month life expectancy, no physical distress and needed care assistance in their daily activities.

prognostic disclosure. In two scenarios where respondents had a life expectancy of 6 or 1–2 months, respectively, they stated their preference for initiating a discussion of prognosis from the following: 'Not to discuss at all', 'Physician to inform me only if I ask', 'Physician to check with me first whether I want to know' or 'Physician to initiate a discussion and inform me in detail'.

treatment of severe refractory physical distress. Respondents rated their treatment preferences for severe refractory physical distress on a four-point Likert-type scale, ranging from 'Absolutely do not want' (1) to 'Strongly want' (4). The options were 'Treatment so that the patient keeps consciousness clear even if distress is not alleviated' (care without sedation), 'Administration of sleeping drugs so that the patient feels no distress because of a reduction in patient consciousness' (palliative sedation therapy) or 'Administration of lethal medications' (euthanasia).

factors associated with preferences

Prior to the survey, relevant factors were conceptualized and grouped into five categories based on a literature review [5, 13, 17, 23–25, 27–32]: 'Concepts of good death', 'Perception of PCUs' 'Cancer-related beliefs', 'Legal knowledge of end-of-life care options' and 'Demographic variables'.

good-death concepts [13, 17]. Respondents rated the importance of 58 components of a good death [13] on a seven-point Likert-type scale. Concepts were classified into 18 domains using an explanatory factor analysis [21]: 'Physical and psychological comfort', 'Dying in a favorite place', 'Good relationship with medical staff', 'Maintaining hope and pleasure', 'Not being a burden to others', 'Good relationship with family', 'Physical and cognitive control', 'Environmental comfort', 'Being respected as an individual', 'Life completion', 'Natural death', 'Preparation for death', 'Role accomplishment and contributing to others', 'Unawareness of death', 'Fighting against cancer', 'Pride and beauty', 'Control over the future' and 'Religious and spiritual comfort'. Each domain score was defined as the mean of the item scores (range = 1–7).

perceptions of PCUs [28, 29]. Respondents rated their levels of agreement with 10 statements about the PCU on a five-point Likert-type scale on the basis of a previous study [28]: 'Alleviates pain', 'Supports patients in living with dignity', 'Provides no medical treatments', 'A place where people only wait to die', 'Shortens the patient's life', 'Expensive', 'Provides compassionate care', 'A place where patients are isolated from the community', 'Supports patients in living peacefully' and 'Provides care for families'. If the respondents did not know what PCUs were, they were instructed to choose 'Do not know'.

cancer-related beliefs [5, 23–25, 27, 31, 32]. Respondents rated their levels of agreement about nine cancer-related belief statements on a five-point Likert-type scale. These comprised three pain-related statements ('Cancer pain is sufficiently relieved if adequately treated', 'Opioids shorten life' and 'Consciousness is clear until death if pain medication is not used'), three communication-related statements ('Physicians are generally poor at communicating bad news', 'Physicians are uncomfortable discussing death' and 'I could not cope if I was told my cancer was incurable'), two hydration-related statements ('Artificial hydration and nutrition should be continued as the minimum standard until death' and 'Artificial hydration and nutrition relieve patient symptoms'), and one home care-related statement ('It would be difficult for me to receive care in my home environment').

legal knowledge of end-of-life care options [30]. Respondents stated whether they thought the following medical acts, if requested by a terminally ill patient, were legal or illegal in Japan: 'Administration of medication for symptom relief when it might shorten life' (the 'double-effect' act) and

'Administration of lethal medications' (euthanasia). At the time of the survey, no laws in Japan governed these practices. After discussion with a legal expert, we reached a consensus opinion that the double-effect act would be regarded as legal and euthanasia as illegal for the purpose of our study.

demographic variables. The respondents reported their age and gender. The general population also reported whether they had a chronic disease (defined as the presence of a regular hospital visit over the previous year) and a bereavement experience caused by cancer within 10 years, and, if so, where the deceased had died.

Despite the possibility of a recall bias, we selected 10 years as the limit of experience of bereavement through cancer in the general population because it yielded similar conclusions to a limit of 5 years.

statistical analyses

End-of-life care preferences were analyzed using descriptive statistics for the three study groups (nonbereaved general population, bereaved general population and PCU bereaved families). We confirmed similar distributions of variables between the four areas sampled, and evaluated the significance of differences in preferences among the three groups using a chi-square test.

To explore the factors associated with preferences, we performed multivariate (for 'Treatment for severe refractory physical distress') logistic regression analysis using all potentially significant predictors identified by the univariate analysis ($P < 0.2$) as independent variables via backward elimination.

We created a multinomial variable capturing the three possible categories of preferred place of care and the four possible categories of preferred prognostic disclosure. To model the multivariate effect of potentially significant predictors on the categorical variables, we performed multinomial regression [33, 34] , which has been used in recent palliative-care research [26].

We combined the general population and PCU-bereaved families as subjects, so subject group was always included in the model.

The independent variables were age, gender, time since patient's death, concept of a good death, and cancer-related beliefs potentially associated with preferences. We tested the following hypotheses: preferences for end-of-life-care setting were influenced by all cancer-related beliefs [5, 29, 32]; preferences for prognostic disclosure were influenced by communication-related beliefs [24, 32]; and preferences for treatment for severe refractory physical distress were influenced by pain-related [31, 32], communication-related [25] and hydration-related beliefs [23, 27]. We also included 'Perceptions of PCUs' in the analysis of 'Place of care' [28, 29], and 'Legal knowledge of end-of-life care options' in the analysis of 'Treatment for severe refractory physical distress' [30], as independent variables.

To facilitate interpretation, we collapsed the five response categories for 'Perceptions of PCUs' into two: 'Strongly agree or agree' and 'Neither agree nor disagree, disagree, strongly disagree or do not know'. In the multivariate logistic regression analysis for 'Treatment of refractory severe physical distress', we collapsed the four response categories into two: 'Absolutely do not want or probably do not want' and 'Probably want or strongly want'.

All analyses were performed using SAS (version 9.1; SAS Institute Inc., Cary, NC, USA). The significance level was set at $P < 0.05$ (two-tailed).

results

Of the 5000 questionnaires sent to the general population, 26 were undeliverable and 2670 were returned to the authors.

Among these respondents, eight refused to participate, 14 were excluded due to missing data, and 2548 responses were analyzed (effective response rate = 51%). Among the respondents from the general population, 25% ($N = 649$) had lost family members from cancer during the previous 10 years. There were no differences in gender and age between these respondents and the general population according to the vital statistics data for 2003 [35].

Among the 866 respondents from PCU-bereaved families considered as potential participants, 72 were excluded due to serious psychological distress ($N = 30$), lack of competent adult family members ($N = 17$) or for other reasons. Of the 794 questionnaires sent to the remaining bereaved families, 56 were undeliverable and 552 were returned to the authors. Within this group, 27 individuals refused to participate, 12 were excluded due to missing data and 513 responses were analyzed (effective response rate = 70%). Comparing the backgrounds of respondents and nonrespondents revealed no differences in gender, age or time since patient's death, but a significant difference in the length of patient's hospital stay (mean = 44 days versus 36 days). Table 1 summarizes the backgrounds of the respondents.

end-of-life care preferences

Summarized in Table 2.

Table 1. Demographic backgrounds of respondents

	General population (N = 2548)		PCU-bereaved families (N = 513)	
	%	n	%	n
Age (years)				
<49	25	613	21	104
50–59	30	758	29	144
60–69	28	710	29	146
>70	17	420	22	110
Gender				
Male	47	1186	32	158
Female	53	1326	68	343
Having chronic disease	40	1023		
Bereavement experience[a]	25	649	100	513
Place of patient's death	100	649	100	513
Home	13	86	0	
Acute hospital	77	502	0	
PCU	5.4	35	100	513
Nursing homes	1.8	12	0	
Other places	2.2	14	0	
Length of hospital stay (mean ± SD/median)			44.4 ± 49.3/29 (days)	
Time since patient's death (years)				
<1	13	207	0	
–3	26	411	71	416
–5	18	280	19	97
–10	43	680	0	
(mean ± SD/median)			28.4 ± 7/28.1 (months)	

SD, standard deviation; PCUs, palliative care units.
[a]Experience of losing a family member from cancer in the previous 10 years.

Table 2. Preferences for end-of-life care

	Nonbereaved general population (N = 1899)		Bereaved general population (N = 649)		PCU-bereaved families (N = 513)		P value[b]
	%	n	%	n	%	n	
Place of end-of-life care and death[a]							
Place of end-of-life care							
Home	46	845	44	279	21	105	<0.0001
Acute hospital	18	334	22	142	6	30	
PCU	36	668	33	212	73	367	
Place of death							
Home	55	1024	50	315	30	150	<0.0001
Acute hospital	15	280	21	131	5	23	
PCU	29	545	29	185	65	325	
Communicating estimated prognosis							
6 month life expectancy							
Not to discuss at all	11	200	11	70	8	38	0.20
Physician to inform me only if I ask	27	498	29	183	28	144	
Physician to check me first whether I want to know	21	398	22	142	25	124	
Physician to initiate discussion and inform me in detail	41	763	38	240	40	200	
1–2 month life expectancy							
Not to discuss at all	17	309	17	106	13	66	0.23
Physician to inform me only if I ask	25	457	26	162	28	140	
Physician to check me first whether I want to know	16	300	19	118	18	91	
Physician to initiate discussion and inform me in detail	43	788	39	249	41	210	
Treatment for severe refractory physical distress							
Care without sedation							
Absolutely do not want	12	215	13	76	12	59	0.04
Probably do not want	36	613	41	243	40	191	
Probably want	42	723	35	212	35	167	
Strongly want	10	175	11	68	12	56	
Palliative sedation							
Absolutely do not want	6	99	5	33	3	16	0.0007
Probably do not want	20	345	18	113	13	62	
Probably want	54	949	52	319	57	277	
Strongly want	21	370	24	149	28	135	
Euthanasia							
Absolutely do not want	19	333	18	110	23	113	0.09
Probably do not want	35	616	32	195	36	175	
Probably want	31	538	32	194	28	137	
Strongly want	15	267	18	106	13	62	

PCU, palliative care unit.
[a]Respondents were asked to choose their desired setting if they had a life expectancy of 1–2 months and no physical distress, but needed assistance in their daily activities.
[b]Determined using chi-square test among the three groups.

place of end-of-life care and death. Approximately 50% of the general population (nonbereaved and bereaved groups) preferred 'Home' as the place of end-of-life care and death, while approximately 70% of the PCU-bereaved families preferred 'PCU' ($P < 0.0001$). In all groups, at least 70% of the respondents preferred either 'Home' or 'PCU' as place of end-of-life care and death, while no more than 20% preferred 'Acute hospital' ($P < 0.0001$).

prognostic disclosure. Across all groups, approximately 10–20% of respondents preferred 'Not to discuss at all', 40% preferred 'Physician to initiate a discussion and inform me in detail', and 50% preferred a negotiated approach (either

'Physician to inform me only if I ask' or 'Physician to check with me first whether I want to know'). The distributions of responses were similar for the scenarios with life expectancies of 6 and 1–2 months.

treatment for severe refractory physical distress. While there was a significant difference in the preference for care without sedation between the groups ($P = 0.04$), approximately 50% of all respondents preferred this option.

Regarding palliative sedation therapy, 75% of the general population preferred this treatment compared with 85% of the PCU-bereaved families ($P = 0.0007$).

For euthanasia, 46–50% of the general population preferred this approach compared with 41% of the PCU-bereaved families. There was no significant difference in preference for euthanasia between groups ($P = 0.09$).

factors associated with preferences

place of end-of-life care. Summarized in Table 3. Respondents who preferred 'Home' were more likely to regard 'Dying in a favorite place', 'Maintaining hope and pleasure', 'Natural death' and 'Religious and spiritual comfort' as important for a good death than those who preferred 'Acute hospital' (reference category).

Respondents who preferred 'PCU' were more likely to regard 'Being respected as an individual' and 'Religious and spiritual comfort' as important for a good death than those who preferred 'Acute hospital' (reference category).

Respondents who preferred 'Acute hospital' were more likely to be older, and to regard 'Unawareness of death' and 'Pride and beauty' as important for a good death, than those who preferred 'Home' or 'PCU', respectively.

Respondents who preferred 'PCU' were more likely to agree with positive statements about the PCU, such as 'Supports patients in living with dignity', 'Provides care for families' and 'Alleviates pain'. By contrast, those who preferred 'Acute hospital' were more likely to consider the PCU as 'A place where patients are isolated from the community'. Other descriptions of the PCU, including 'Provides no medical treatments', 'A place where people only wait to die', 'Shortens the patient's life' or 'Expensive', were not significantly associated with a preference for 'PCU' (data not shown).

prognostic disclosure (1–2 month scenario). Summarized in Table 4. Respondents who preferred knowing their prognosis were more likely to regard 'Control over the future' as important for a good death, and less likely to regard 'Unawareness of death' as important, or to agree with the statement 'I could not cope if I was told my cancer was incurable'.

treatment for severe refractory physical distress. Summarized in Table 5. Respondents who preferred care without sedation were

Table 3. Factors associated with preference for place of end-of-life care

	Home			PCU		
	Odds ratio	95% CI		Odds ratio	95% CI	
Background of respondents						
Age (per decade)	0.77	0.67–0.89	***	0.76	0.65–0.88	***
Groups						
Nonbereaved general population/Bereaved general population	1.47	1.07–2.02	*	1.49	1.06–2.09	*
PCU bereaved families/Bereaved general population	1.39	0.76–2.56		4.62	2.58–8.26	***
Perceptions of PCUs[a]						
Support patients in living with dignity	1.21	0.83–1.77		1.86	1.26–2.73	***
Provide care for families	1.57	1.08–2.28	*	2.60	1.77–3.80	***
Alleviate pain	1.28	0.91–1.82		1.72	1.21–2.46	**
Isolate patients from the community	0.98	0.70–1.38		0.67	0.47–0.95	*
Good death[b]						
Dying in a favorite place	1.43	1.20–1.70	***	1.01	0.85–1.20	
Unawareness of death	0.75	0.63–0.89	**	0.82	0.68–0.98	*
Pride and beauty	0.76	0.63–0.93	**	0.69	0.57–0.84	***
Maintaining hope and pleasure	1.42	1.14–1.77	**	1.14	0.91–1.42	
Natural death	1.25	1.08–1.45	**	1.14	0.98–1.33	
Religious and spiritual comfort	1.16	1.05–1.29	**	1.16	1.04–1.29	**
Being respected as an individual	1.03	0.85–1.26		1.25	1.02–1.54	*
Good relationship with family	1.12	0.88–1.41		0.72	0.57–0.91	**
Cancer-related beliefs[c]						
It is difficult for me to receive care at home in my home care environment	0.61	0.52–0.71	***	1.14	0.96–1.35	
Artificial hydration and nutrition should be continued as the minimum standard until death	0.82	0.69–0.98	*	0.77	0.64–0.92	**
Physicians are uncomfortable discussing death	1.21	1.02–1.44	*	1.05	0.88–1.26	
Max-rescaled R^2 0.36						

The dependent variable had three categories: acute hospital, home and PCU. The latter two were compared with the former (acute hospital category), which was omitted from the tables. Only outcomes found to have significant results in multivariate analysis are presented.
CI, Confidence interval; *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$.
[a]Rated on a five-response category, and collapsed into: '1 (strongly agree) or 2 (agree)' and '3 (neither agree nor disagree), 4 (disagree), 5 (strongly disagree) or did not know'. The former was compared with the latter.
[b]Rated as the degree of importance of each statement from 1 (absolutely unnecessary) to 7 (absolutely necessary).
[c]Rated as the degree of agreement with each statement from 1 (strongly disagree) to 5 (strongly agree).

Table 4. Factors associated with preference for prognostic disclosure

	(Physician to inform me only if I ask)			(Physician to check me first whether I want to know)			(Physician to initiate discussion and inform me in detail)		
	Odds ratio	95% CI		Odds ratio	95% CI		Odds ratio	95% CI	
Background of respondents									
Age (per decade)	0.96	0.84–1.11		0.83	0.71–0.98	*	1.03	0.89–1.19	
Good death[a]									
Control over the future	1.45	1.26–1.67	***	2.96	2.46–3.56	***	3.35	2.83–3.95	***
Unawareness of death	0.70	0.58–0.83	***	0.48	0.39–0.59	***	0.43	0.36–0.52	***
Pride and beauty	0.95	0.79–1.14		0.82	0.67–1.01		0.78	0.64–0.94	**
Preparation for death	1.24	1.03–1.49	*	1.11	0.89–1.38		1.24	1.01–1.51	*
Cancer-related beliefs[b]									
I could not cope if I was told my cancer was incurable	0.70	0.60–0.82	***	0.53	0.44–0.64	***	0.38	0.32–0.45	***
Max-rescaled R^2 0.32									

The dependent variable had four categories: 'Not to discuss at all', 'Physician to inform me only if I ask', 'Physician to check me first whether I want to know', or 'Physician to initiate discussion and inform me in detail'. The last three were compared with the first category ('Not to discuss at all'), which was omitted from the tables. Only outcomes found to have significant results in multivariate analysis are presented.
CI, Confidential interval; *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$.
[a]Rated as the degree of importance of each statement from 1 (absolutely unnecessary) to 7 (absolutely necessary).
[b]Rated as the degree of agreement with each statement from 1 (strongly disagree) to 5 (strongly agree).

more likely to regard 'Fighting against cancer', 'Physical and cognitive control' and 'Preparation for death' as important for a good death; they were less likely to regard 'Physical and psychological comfort', 'Not being a burden to others' and 'Unawareness of death' as important for a good death, or to have legal knowledge of the double-effect act.

Compared with other respondents, those who preferred palliative sedation therapy were older, more likely to regard 'Physical and psychological comfort' and 'Unawareness of death' as important for a good death, and to agree with the statements 'I could not cope if I was told my cancer was incurable' and 'Cancer pain is sufficiently relieved if adequately treated'.

Compared with other respondents, those who preferred euthanasia were older, more likely to regard 'Physical and psychological comfort', 'Control over the future', 'Not being a burden to others' and 'Unawareness of death' as important for a good death, and to agree with the statement 'Physicians are uncomfortable discussing death'. They were less likely to regard 'Fighting against cancer' as important for a good death or to agree that 'Cancer pain is sufficiently relieved if adequately treated', and more likely to have legal knowledge about euthanasia.

discussion

To our knowledge, this is the first population-based survey clarifying the association between end-of-life care preferences and good-death concepts.

In a scenario where participants had incurable cancer, no physical distress and needed assistance with daily activities, most preferred end-of-life care and death at home or in a PCU. Moreover, PCU-bereaved families were more likely to prefer PCUs than the general population. Thus, PCUs had made a favorable impression on the bereaved families. In Japan, the proportions of cancer patients who died at home or at a PCU in 2003 were only 6% [35] and 4.4% (Hospice Palliative Care Japan, unpublished data), respectively.

In Japan, many people regard a home death as unrealizable, because of insufficiencies in the home-care system and concern about caregiver burden [5]. Thomas and colleagues [36] reported that patient's informal care resources, and their experiences of health and social services, shaped their preferences for place of end-of-life care. Consistent with these recent findings [5, 36], in our current study, respondents who believed that they could not receive in-home care were significantly more likely to prefer hospitals to home. Thus, our results highlight the need for regional palliative-care programs, including home systems [20] and local inpatient services, to create a network and to deliver end-of-life care according to the preferences of patients and families [37]. It is thus important in future studies to clarify what family caregivers regard as a burden and also what patients feel makes them a burden to others in their care settings.

Consistent with findings in Australia [7], approximately 50% of our respondents preferred negotiating with their physician concerning prognostic disclosure. Notably, the preference for prognostic disclosure was associated with the good-death concept (specifically 'Control over the future' and 'Unawareness of death'). This finding suggests that approximately 50% of patients desire some level of negotiation about communication of prognosis, and that some Japanese patients do not necessarily consider autonomy as the most relevant factor, preferring to entrust decisions to their physicians [13]. In addition, 'Unawareness of death' seems more important in Japan than in Western countries, so living as usual without a feeling of impending death could be a core factor for the Japanese concept of a good death [21]. Thus, Japanese clinicians should recognize that routine prognostic disclosure and encouraging self-determination might not

Table 5. Factors associated with preference for treatment for refractory severe physical distress

	Care without sedation			Palliative sedation therapy			Euthanasia		
	Odds ratio	95%CI		Odds ratio	95%CI		Odds ratio	95%CI	
Background of respondents									
Age (per decade)				1.23	1.1–1.36	***	1.15	1.04–1.27	**
Groups									
Nonbereaved general populations/ bereaved general population									
PCU bereaved families/bereaved general population							0.63	0.47–0.85	**
Good death[a]									
Physical and psychological comfort	0.58	0.5–0.67	***	1.80	1.55–2.12	***	1.57	1.35–1.81	***
Control over the future							1.58	1.42–1.75	***
Not being a burden to others	0.79	0.69–0.90	***				1.37	1.20–1.56	***
Unawareness of death	0.80	0.72–0.89	***	1.18	1.05–1.32	**	1.27	1.13–1.43	***
Good relationship with medical staff				1.30	1.07–1.56	**			
Fighting against cancer	1.59	1.45–1.75	***				0.63	0.57–0.70	***
Physical and cognitive control	1.41	1.23–1.63	***						
Preparation for death	1.26	1.13–1.41	***						
Role accomplishment and contributing to others							0.86	0.77–0.97	*
Good relationship with family							0.84	0.72–0.99	*
Religious and spiritual comfort							0.90	0.84–0.97	**
Environmental comfort	0.86	0.75–1.00	*						
Dying in a favorite place				0.86	0.75–0.99	*			
Cancer-related beliefs[b]									
Cancer pain is sufficiently relieved if adequately treated				1.20	1.06–1.36	**	0.84	0.75–0.94	**
I could not cope if I was told my cancer was incurable				1.24	1.11–1.40	***			
Physicians are uncomfortable discussing death							1.15	1.02–1.28	*
Opioids shorten life							1.14	1.02–1.27	*
Correct legal knowledge of care options									
Double-effect act	0.78	0.65–0.93	**						
Euthanasia							0.45	0.37–0.56	***
Max-rescaled R²	0.17			0.12			0.23		

Only outcomes founded to have significant results in multivariate analysis are presented.

CI, Confidential interval; *, P < 0.05; **, P < 0.01; ***, P < 0.001.

[a]Rated as the degree of importance of each statement from 1 (absolutely unnecessary) to 7 (absolutely necessary).

[b]Rated as the degree of agreement with each statement from 1 (strongly disagree) to 5 (strongly agree).

always be desirable for all patients, and that the physician–patient discussion premised on imminent death and preparing concerns for the aftermath might undermine a good death for some patients. Clinicians, however, face the challenge of helping their patients to achieve a complete life while facing their own mortality at the same time. Thus, communication skills focusing on daily concerns and negotiating short-term goals with careful consideration of the patient's good death concepts are of importance.

When facing severe refractory suffering, most respondents preferred sedation, although some preferred care without sedation or euthanasia. Consistent with previous studies [11, 16, 38], those who wanted care without sedation were more likely to regard preservation of intellectual activities as important for quality of dying, whereas those who preferred euthanasia were more likely to value not being a burden, having

symptom control and control over the future. Thus, clinicians should identify good-death concepts and explore the best solution for individuals, particularly through discussions about balancing symptom control and degree of consciousness.

PCU-bereaved families were less likely to prefer euthanasia than the bereaved general population, suggesting that experience of good-quality palliative care influenced their preferences. Physicians should thus communicate empirical evidence of high success rates for pain control and legal issues to their patients.

Our study had several limitations. First, because respondents were not terminally ill, the results could not necessarily be extrapolated to cancer patients. The patient's perspective is important, but we did not survey cancer patients because questions regarding dying were considered too burdensome to such patients in Japan. We believe, however, that this study

provides a unique and valuable perspective because bereaved families who had experienced end-of-life care at home, in acute hospitals, and in specialized inpatient PCUs (the best available practices in Japan) provided useful suggestions, and the generalizability was supported by the fact that 40% of the participants in the general population had a chronic disease. Second, the response rate among the general population was low, although similar to the average for population-based surveys in Japan [5]. Thus, a response bias might exist. Moreover, a relatively long interval, such as 10 years, might cause a recall bias, although it yielded similar conclusions to a limit of 5 years; it could also be influenced by changes in medical services over this time period. Third, preferences might change [6, 39] if individuals experienced the situations explored in the scenarios; future studies should evaluate the decision-making process longitudinally.

In conclusion, our analysis revealed that PCU-bereaved families were more likely to prefer PCUs as a place of end-of-life care, and less likely to prefer euthanasia than the general population. The PCUs were well received by bereaved families, and experience of high-quality palliative care influenced their preferences. Systematic efforts to improve the availability of good-quality palliative care are needed. Moreover, end-of-life care preferences were associated with good-death concepts, highlighting the importance of identifying patients' general goals before discussing specific treatment choices, as recommended in the Education in Palliative and End-of-life Care curriculum [40]. We therefore recommend that health-care providers should identify not only patients' preferences for end-of-life care, but also their beliefs about a good death, which should help to improve the quality of the dying process.

appendix

end-of -life care preferences (in a scenario where you had incurable cancer)

(1) Place of end-of-life care and death

If you had a 1–2 month life expectancy and no physical distress, but needed care assistance in your daily activities, which place would you prefer, and as a place of death? (Three possible categories: 'Home', 'Acute hospital' or 'PCU'.)

(2) Prognostic disclosure

If you had a 6-month life expectancy, how would you prefer to initiate a discussion of prognosis; and if you had a life expectancy of 1–2 months? (Four possible categories: 'Not to discuss at all'; 'Physician to inform me only if I ask', 'Physician to check with me first whether I want to know' or 'Physician to initiate a discussion and inform me in detail'.)

(3) Treatment of severe refractory physical distress

If you had severe refractory distress, would you want the following treatment?

(a) Treatment so that the patient keeps consciousness clear even if distress is not alleviated (care without sedation).

(On a four-point Likert-type scale, ranging from '1. Absolutely do not want' to '4. Strongly want'.)

(b) Administration of sleeping drugs so that the patient feels no distress because of a reduction in patient consciousness' (palliative sedation therapy). (On a four-point Likert-type scale, ranging from '1. Absolutely do not want' to '4. Strongly want'.)

(c) Administration of lethal medications' (euthanasia). (On a four-point Likert-type scale, ranging from '1. Absolutely do not want' to '4. Strongly want'.)

references

1. Emanuel EJ, Emanuel LL. The promise of a good death. Lancet 1998; 351 (Suppl 2): SII21–29.
2. Stewart AL, Teno J, Patrick DL, Lynn J. The concept of quality of life of dying persons in the context of health care. J Pain Symptom Manage 1999; 17: 93–108.
3. Chen H, Haley WE, Robinson BE et al. Decisions for hospice care in patients with advanced cancer. J Am Geriatr Soc 2003; 51: 789–797.
4. Higginson IJ, Sen-Gupta GJ. Place of care in advanced cancer: a qualitative systematic literature review of patient preferences. J Palliat Med 2000; 3: 287–300.
5. Minister's Secretariat, Ministry of Health, Labour and Welfare. Report on Opinion Survey Regarding End of Life Care. (In Japanese). http://www.mhlw.go.jp/shingi/2004/2007/s0723-2008.html (2 April 2007, date last accessed).
6. Townsend J, Frank AO, Fermont D et al. Terminal cancer care and patients' preference for place of death: a prospective study. BMJ 1990; 301: 415–417.
7. Hagerty RG, Butow PN, Ellis PA et al. Cancer patient preferences for communication of prognosis in the metastatic setting. J Clin Oncol 2004; 22: 1721–1730.
8. Yun YH, Lee CG, Kim SY et al. The attitudes of cancer patients and their families toward the disclosure of terminal illness. J Clin Oncol 2004; 22: 307–314.
9. Matsumura S, Fukuhara S, Bito S. Preferences regarding the disclosure of cancer diagnosis and related factors in Japan. (In Japanese). Nihon-iji-shinpo 1997; 3830: 37–42.
10. Emanuel EJ, Fairclough DL, Daniels ER et al. Euthanasia and physician-assisted suicide: attitudes and experiences of oncology patients, oncologists, and the public. Lancet 1996; 347: 1805–1810.
11. Morita T, Hirai K, Okazaki Y. Preferences for palliative sedation therapy in the Japanese general population. J Palliat Med 2002; 5: 375–385.
12. Wilson KG, Scott JF, Graham ID et al. Attitudes of terminally ill patients toward euthanasia and physician-assisted suicide. Arch Intern Med 2000; 160: 2454–2460.
13. Hirai K, Miyashita M, Morita T et al. Good death in Japanese cancer care: a qualitative study. J Pain Symptom Manage 2006; 31: 140–147.
14. Payne SA, Langley-Evans A, Hillier R. Perceptions of a 'good' death: a comparative study of the views of hospice staff and patients. Palliat Med 1996; 10: 307–312.
15. Steinhauser KE, Clipp EC, McNeilly M et al. In search of a good death: observations of patients, families, and providers. Ann Intern Med 2000; 132: 825–832.

16. Suarez-Almazor ME, Newman C, Hanson J et al. Attitudes of terminally ill cancer patients about euthanasia and assisted suicide: predominance of psychosocial determinants and beliefs over symptom distress and subsequent survival. J Clin Oncol 2002; 20: 2134–2141.

17. Vig EK, Davenport NA, Pearlman RA. Good deaths, bad deaths, preferences for the end of life: a qualitative study of geriatric outpatients. J Am Geriatr Soc 2002; 50: 1541–1548.

18. Charlton RC. Attitudes towards care of the dying: a questionnaire survey of general practice attenders. Fam Pract 1991; 8: 356–359.

19. Maeyama E, Kawa M, Miyashita M et al. Multiprofessional team approach in palliative care units in Japan. Support Care Cancer 2003; 11: 509–515.

20. Fukui S, Kawagoe H, Masako S et al. Determinants of the place of death among terminally ill cancer patients under home hospice care in Japan. Palliat Med 2003; 17: 445–453.

21. Miyashita M, Sanjo M, Morita T et al. Good death in Japanese cancer care: A Nationwide Quantitative Study. Ann Oncol 2007; 18: 1090–1097.

22. Morita T, Miyashita M, Shibagaki M et al. Knowledge and beliefs about end-of-life care and the effects of specialized palliative care: a population-based survey in Japan. J Pain Symptom Manage 2006; 31: 306–316.

23. Chiu TY, Hu WY, Chuang RB et al. Terminal cancer patients' wishes and influencing factors toward the provision of artificial nutrition and hydration in Taiwan. J Pain Symptom Manage 2004; 27: 206–214.

24. Curtis JR, Patrick DL, Caldwell ES et al. Why don't patients and physicians talk about end-of-life care? Barriers to communication for patients with acquired immunodeficiency syndrome and their primary care clinicians. Arch Intern Med 2000; 160: 1690–1696.

25. Emanuel EJ, Fairclough D, Clarridge BC et al. Attitudes and practices of U.S. oncologists regarding euthanasia and physician-assisted suicide. Ann Intern Med 2000; 133: 527–532.

26. Lamont EB, Christakis NA. Prognostic disclosure to patients with cancer near the end of life. Ann Intern Med 2001; 134: 1096–1105.

27. McClement SE, Degner LF, Harlos MS. Family beliefs regarding the nutritional care of a terminally ill relative: a qualitative study. J Palliat Med 2003; 6: 737–748.

28. Morita T, Akechi T, Ikenaga M et al. Late referrals to specialized palliative care service in Japan. J Clin Oncol 2005; 23: 2637–2644.

29. Ronaldson S, Devery K. The experience of transition to palliative care services: perspectives of patients and nurses. Int J Palliat Nurs 2001; 7: 171–177.

30. Silveira MJ, DiPiero A, Gerrity MS et al. Patients' knowledge of options at the end of life: ignorance in the face of death. JAMA 2000; 284: 2483–2488.

31. Weiss SC, Emanuel LL, Fairclough DL et al. Understanding the experience of pain in terminally ill patients. Lancet 2001; 357: 1311–1315.

32. Yabroff KR, Mandelblatt JS, Ingham J. The quality of medical care at the end-of-life in the USA: existing barriers and examples of process and outcome measures. Palliat Med 2004; 18: 202–216.

33. Agresti A. An Introduction to Categorical Data Analysis. New York: Wiley 1996.

34. Hosmer DW, Lemeshow S.. Applied Logistic Regression. New York: Wiley 2000.

35. Minister's Secretariat, Ministry of Health, Labour and Welfare. Vital Statistics. 2003 http://dbtk.mhlw.go.jp/toukei/data/010/2003/toukeihyou/0004649/t0095927/JC0050000_0004001.html (2 April 2007, date last accessed).

36. Thomas C, Morris SM, Clark D. Place of death: preferences among cancer patients and their carers. Soc Sci Med 2004; 58: 2431–2444.

37. Aitini E, Cetto GL. A good death for cancer patients: still a dream? Ann Oncol 2006; 17: 733–734.

38. Ganzini L, Nelson HD, Schmidt TA et al. Physicians' experiences with the Oregon Death with Dignity Act. N Engl J Med 2000; 342: 557–563.

39. Fried TR, Byers AL, Gallo WT et al. Prospective study of health status preferences and changes in preferences over time in older adults. Arch Intern Med 2006; 166: 890–895.

40. EPEC Project. The Negotiating Goals of Care. http://www.epec.net/EPEC/Webpages/Ecommerce/itemDetail.cfm?productID=85(2 April 2007, date last accessed).

Primary concerns of advanced cancer patients identified through the structured life review process: A qualitative study using a text mining technique

MICHIYO ANDO, R.N., PH.D.,[1] TATSUYA MORITA, M.D.,[2] AND
STEPHEN J. O'CONNOR, R.N., M.SC.[3]

[1]Faculty of Nursing, St. Mary's College, Fukuoka Japan
[2]Department of Palliative and Supportive Care, Palliative Care Team, and Seirei Hospice, Seirei Mikatahara General Hospital, Hamamatsu, Japan
[3]Faculty of Society and Health, Buckinghamshire Chilterns University College, Chalfont St. Giles, UK

ABSTRACT

Objective: This study aims to clarify characteristics of the contents of life review in reminiscence therapies in cancer patients by age, gender, and stage of disease.

Methods: Sixteen patients who were terminally ill and were receiving anticancer treatments participated in life review therapy. Patients reviewed there lives according to their developmental stage, and they mainly reviewed impressive achievements. A clinical psychologist interviewed each patient four times and the total number of sessions was 64. The contents of each life review were transcribed, and a correspondence analysis and a significance test were conducted on these data to choose characteristic words or phrases.

Results: The main concern of 40-year-olds was "about children." For 50-year-olds, it was "how to confront death" and for 60-year-olds, "death-related anxiety" and "new discoveries". For 70-year-olds, "resignation about death" and "evaluative reminiscence of their lives" were most important, and for 80-year-olds the main concern was "relationships with others." When analyzing the data according to disease stage and gender, "transcendence to children", "reflection on their past behavior", and "gratitude for my family" were characteristic words for males receiving treatment, "work," "worries about children," "side effects," "homecare," and "reflection on their past behavior" were characteristic words for females receiving treatment. "Physical condition", "desire for death" and "how to confront death" were common phrase for males in the terminal stages of the disease process, while "resignation to life" was characteristic reaction for females.

Significance of results: There appear to be considerable differences in the focus of life review interviews by age, disease age, disease stage, and gender. Clinicians should consider these differences when using life-review therapy in order to tailor it to the individual.

KEYWORDS: Life review, Death and dying, Age, Disease stage, Gender

INTRODUCTION

Patients often review their disease history or their lives in nursing or care situations. Many studies on reminiscence therapy have been conducted for the elderly in which they review their lives (Butler, 1974; Haight, 1988; Haight et al., 1995). These studies are mainly of three types (Thornton & Brotchie, 1987). The first are studies about the effects of reminiscence therapy, which demonstrate effects on depression (Haight et al., 2000), self-esteem (Haight et al., 1998), and life satisfaction (Haight, 1988).

Corresponding author: Michiyo Ando, St. Mary's College, Tsubukuhonmachi 422, Kurume city, Fukuoka, Japan. E-mail: andou@st-mary.ac.jp

The second are interview studies such as the function of reminiscence therapy (Wong & Watt, 1991) or contents analysis; the third consists of the data from questionnaires (Webster, 1993). The present study is about contents analysis concerning the method of life review, which is included in the second category.

Structured life review is the most popular method in which reviewers look back at their lives along developmental stages similar to those outlined by Erikson (Haight, 1988). The other method is the autobiographical method (de Vries et al., 1995), in which reviewers write about a particular theme, for example, "love" or "family." They then talk their life experience of these themes in groups. Reminiscence therapy has three kinds of functions (Coleman, 1974). First is "simple reminiscence," in which the elderly review only their good memories. The second is "informative reminiscence," in which the elderly talk about their precious or formative experience from past experiences; and the third is "life review," in which the elderly review and evaluate their lives or an individual basis. The functions of reminiscence therapy have been categorized in more detail by Wong & Watt (1991).

Although patients often review their lives in nursing or care situations, relatively few studies on reminiscence therapy are available. Pickrel (1989) suggested that the effects of this therapy may hold possibility for cancer patients, and Wholihan (1992) demonstrated how various tools like photographs could be used to promote reminiscence therapy. Ando et al. (2006*a*) showed the effects of this therapy on depression and self-esteem, and Ando et al. (2007) demonstrated the effects of this therapy on quality of life for cancer patients. Moreover, Chochinov et al. (2005) demonstrated the effects of patients' life review, although the term "reminiscence therapy" was not used in this study. However, few studies consider the most appropriate methods for this therapy in cancer patients, and their emotional states are likely to differ depending upon their ages, gender, and stages of the disease. To promote reminiscence therapy methods and tailor them to individual cancer patients, we investigated differences in reminiscence therapy by choosing characteristic words and phrases in interviews from the viewpoint of age, gender, and disease stages in patients receiving anticancer treatments and those in the terminal stage of the illness.

METHODS

Subjects

The study included 4 cancer patients (1 man, 3 women) who were undergoing radiation treatment or chemotherapy in a general hospital and 12 cancer patients (2 men, 10 women) with incurable cancer receiving specialized inpatient palliative care in the same region. The inclusion criteria for this study were (1) the patient had cancer, (2) the patient had no cognitive impairment, (3) the patient was 20 years of age or older, and (4) the primary physicians agreed that the patient would benefit from the psychological intervention of reminiscence therapy. The patients' ages ranged from 43 to 82 years, with a mean of 64. The primary tumor sites were breast ($n = 5$), liver ($n = 2$), colon ($n = 2$), lung ($n = 2$), thyroid ($n = 1$), stomach ($n = 1$), gallbladder ($n = 1$), uterus ($n = 1$), and prostate ($n = 1$).

Procedure

Ethical aspects of this study were validated by both the board and the ethical committee of two hospitals. An interviewer was a clinical psychologist. The interview procedure entailed a structured life review interview in which patients reviewed their childhood, adolescence, adult life, and current situation. Some of the questions asked were as follows: (1) Please tell me about your childhood. (2) Which events do you remember as being most impressive during your childhood? (3) How do you feel now when you review those impressive events? Four sessions were planned for each patient. Interviews were conducted in the dayroom or at the bedside. The contents of the patient's life review were recorded by the interviewer in the form of notes taken during or immediately after the session.

Analysis

Text mining is used to extract specific information from a large amount of textural data. We used Word Miner (Japan Information Processing Service, 2003). For example, when a company requires information on their customers' opinions, questions such as "What are the major concerns?" or "Who wants what?" are asked in a questionnaire. The responses are collected in the form of sentences, which are used as the raw data for text mining. Text mining involves three processes: feature extract (word segmentation and categorization or other functions to enter into the next process), the mining process (clustering or association by cluster analysis or correspondence analysis), and visualization (graphs or tables). A test was conducted such that the ratio of appearance frequency of fragments in the category (e.g., 40-year-olds group) versus all categories (e.g., all ages group). Morohoshi et al. (1999) demonstrated the efficacy of text mining in a consumers survey exploring their preference. We used text mining to obtain meaningful words when categorizing the

contents of each interview by age, stage of disease, and gender.

In the first process of text mining, characteristic extraction was performed, that is, the words in each sentence were separated. Words that had the same meaning were counted as the same word, for example, both "mom" and "mother" were counted as "mother." Moreover, articles or punctuation marks were deleted, leaving only meaningful words. These words are called "fragments." Text mining elicited 118 fragments, which were then subjected to correspondence analysis for chosen effective characteristics. In the present study, we conducted correspondence analysis on fragments pertaining to age, gender, and disease stages. In the final process of text mining, the results were presented in the form of tables and graphs.

RESULTS

From correspondence analysis between fragments and age, three components were chosen. Accumulative contribution ratio was 81.64%, and it shows the usefulness of this analysis. A test to choose significant (effective) words or phrases was conducted after correspondence analysis (Ohsumi, 2006), after which, the highest and lowest raking words or phrases in a category were chosen (Table 1). The highest raking fragments in the words of 40-year-olds represented concerns regarding children such as "My children are my emotional mainstay," "I hang on for my children," and "My children cannot accept my disease." These were chosen as the most influential words for this group of patients.

In the words of 50-year-olds, practical matters such as "I put things in order (concerns about aftermath)" and "I recovered from the shock" or willingness to confront death such as "I do not want to prolong my life" or "I want to die without suffering" were more commonly expressed.

Among 60-year-olds, words or phrases relating to spiritual pain such as "I desire to receive euthanasia," "I hate to be a burden to others," or "I want to live longer" were chosen. In addition, reflections on their behavior such as "I understand others' sufferings" or "I was an inconsiderate person" were also chosen.

In the words of 70-year-olds, mortality of death such as "Everyone passes the road to death" and "Let things take their course," or new discoveries such as "I have hurt others' feelings" and "I was an inconsiderate person" were observed. Moreover, evaluative words referring to the past such as "I have good memories of my mother" or "I enjoyed volunteer activities" were indicated more often than in the other age group.

In 80-year-olds, words showing dependence on others such as "I am influenced by my children," "Doctors help me," and "My children are kind to me" were chosen.

In the next analysis, following correspondence analysis and significance testing between fragments and the combination of gender and disease stages, two components were chosen and accumulative contribution ratio was 70.82%, which shows the usefulness of this analysis. High and low ranking words and phrases were chosen (Table 2).

For men receiving anticancer treatments, phrases emphasizing traditional concerns such as "I want to teach to my children" were the most influential words used by interviewees together with their rediscoveries of family values such as "I am grateful to my family," and "I share a strong family bond." For females receiving treatment, worries about children such as "My children cannot accept my disease," and "My children are my emotional mainstay" were characteristic words. Moreover, words related with daily life such as "I enjoyed my work," "I enjoyed volunteer activities," "I suffer from side effects," "I am glad to be able to eat a meal," or "I am anxious about home care" were their main concern.

For males in the terminal stage, words about how to confront death such as "I put things in order (preparing for death)," physical condition such as "I feel good," or adaptive wishes such as "I want to be away overnight" were chosen. For females in the terminal stages of cancer, words of resignation such as "Let things take their course" or "Everyone passes the road to death" were chosen together with words about human relationships such as "My family share good relationships."

DISCUSSION

Our analysis of the data shows that there are differences among characteristic words at each age. Patients in the 40-year-old group were mainly interested in children. Many words regarding children were related to worries about the future. It may be common in other countries that parents suffer when they cannot perform their parental role, but in addition, in Japanese culture, there is also a strong desire that people should not be a burden to others (Morita et al., 2004), despite being a family member.

Similar to the problems of a being a burden, telling the truth or talking about death with family members seem to be difficult because both patients and family think that they should not be a burden to each other, but, sometimes, patients are lonely because they cannot talk about death-related anxiety. This mechanics may bebased on Japanese spirit (Kitayama, 1999). Clinicians should help patients and family members

Table 1. *Words or Phrases which were selected by correspond analysis and significant test by ages*

Order	40 years old Significant fragments	value	50 years old Significant fragments	value	60 years old Significant fragments	value	70 years old Significant fragments	value	80 years old Significant fragments	value
No. 1	I enjoyed my work.	3.08	I put things in order.	2.95	The romantic relationships were not good.	2.96	I feel good.	2.89	I am influenced by my children.	2.65
No. 2	I want to teach to my children.	2.71	I want to be away overnight.	2.95	I desire to receive euthanasia.	2.21	I was an inconsiderate person.	2.89	Doctors help me.	2.65
No. 3	I hang on for my children.	2.71	My physical condition is good.	2.41	I am dissatisfied with previous treatments.	2.21	Everyone passes the road to death.	2.46	My parents were kind and tender.	2.27
No. 4	My children are my emotional mainstay.	2.31	I did not expect to get cancer.	1.74	I was dying once.	2.21	Let things take their course.	1.97	I share good relations with my family.	2.01
No. 5	My children cannot accept my disease.	2.31	I experienced a lonely childhood.	1.74	I was an inconsiderate person.	2.21	I enjoyed volunteer activities.	1.97	My physical condition is good.	2.01
No. 6	I regret delayed discovery of cancer.	2.31	I recovered from shock.	1.74	I hate to be a burden to others.	2.21	I have lived with my family's support.	1.97	I feel good.	1.23
No. 7	I share good relations with my brothers.	1.84	I like pets.	1.74	I understand others' sufferings.	2.21	I have hurt others' feelings.	1.97	I underwent rehabilitation.	1.15
No. 8	I am anxious about home care.	1.84	I do not want to prolong my life.	1.74	I am dissatisfied with my life.	2.21	I recognized after I got cancer.	1.97	I share bad relations with my family.	1.15
No. 9	My child believes that I will recover from cancer.	1.84	I value nature's beauty.	1.74	There is no value to life.	2.21	I have good memories of my mother.	1.93	I share good relations with my family.	1.15
No. 10	My medication causes mood swings.	1.84	I want to go home.	1.74	I regret the delayed discovery of cancer.	2.21	I have experienced the peaceful death of family members.	1.38	My children are kind to me.	1.15
No. 11	I am concerned for my family.	1.26	I want to die without suffering.	1.74	I could not believe that I had cancer.	2.21	I believe more in destiny than luck.	1.38	I want to continue my hobbies.	1.15
No. 12	I am grateful to my family.	1.26	Last moments' worries have been resolved.	1.74	I cannot move freely.	2.15	I quit my work after marriage.	1.38	I want to walk.	1.15
No. 13	I share a strong family bond.	1.26	I will not be able to move freely.	1.74	There were no explanations for treatments before.	1.78	I have hung on until now.	1.38	My family vests me at the hospital.	0.91
No. 14	I took care of my family.	1.26	I wonder if I should resolve old problems.	1.74	My physical condition is bad.	1.78	I am resting in a hospital now.	1.38	I enjoyed my hobbies.	0.57
No. 15	I liked taking care of my brothers.	1.26	I am not happy to die now.	1.26	I want to live longer.	0.77	I enjoyed conversations with others.	1.38	I have good memories of my mother.	0.57

Table 2. *Characteristic words or phrases selected by correspondent analysis and significance test*

Rank	anticancer treatments males	value	anticancer treatments females	value	terminal males	value	terminal females	value
No.1	I want to teach to my children.	4.19	I enjoyed my work.	2.95	I put things in order.	3.21	I enjoyed my hobbies.	2.45
No.2	I hang on for my children.	2.29	I was an inconsiderate person.	2.59	I want to be away overnight.	3.21	My family share good relationships	2.06
No.3	I am grateful to my family.	2.25	My children are my emotional mainstay.	2.2	I feel good.	2.63	My physical condition was bad.	2.06
No.4	I share a strong family bond.	2.25	My children can not accept my disease.	2.2	I coul not believe that I had cancer.	1.93	Everyone pass the road to death.	2.06
No.5	I was an incosiderate person.	2.25	I regret delayed discovery of cancer.	2.2	I experienced a lonely childhood.	1.93	Let thing takes their coursese.	1.62
No.6	My turning point is at job change.	2.25	I enjoyed volunteer activities.	1.74	I recovered from shock.	1.93	There were no explanations for treatments before.	1.62
No.7	I have sweet memories of my childhood.	2.25	I share good relations with my brothers.	1.74	I do not want to prolong my life.	1.93	I have lived with my family's suport.	1.62
No.8	I enjoyed trips.	2.25	I am anxious about home care.	1.74	I value nature's beauty.	1.93	My parents were kinds to me.	1.62
No.9	I understand other's sufferings.	1.83	My child believes that I will recover from cancer.	1.74	I want to go home.	1.93	My physical condition was bad.	1.46
No.10	I can not move freely.	1.57	My mdedication causees mood swing.	1.74	I want to die without sufferings.	1.93	The romantic relationships were not good.	1.62
No.11	I began to consider others.	0.92	I am glad to be able to eat a meal.	1.74	Last moments' worries have been resolved.	1.93	I feel good.	1.46
No.12	I want to do something for my family.	0.8	I have hurt others' feelings.	1.74	I will not be able to move freely.	1.93	I want to live longer.	1.08
No.13	I think about enjoyments.	0.8	I recognized after I got illness.	1.74	I wonder if I should resolve old problems.	1.93	I like pets.	1.08
No.14	I worry about cancer recurrence.	0.8	I feel good.	1.63	I am not happy to die now.	1.93	I desire for eusanasia.	1.08
No.15	I am dissatisfied with my life.	0.8	I suffer from side effects.	1.63	I want to live longer.	1.46	I am dissatisfied with previous treatments.	1.08

to tell their emotion or intention redundantly to release their burdens.

Patients in the 50- and 60-year-old groups were more likely to be preoccupied by death-related anxiety about how they would confront the imminence of their own death. They may not expect to be cured of cancer, and they seem to try to prepare for death while reconstructing their lives to include the reality of their disease. Clinicians should therefore sympathetically help patients to find realistic solutions to these problems and develop coping strategies during the life review process. Moreover, to the sufferings such as "I desire to receive euthanasia" or "There is no value to life," "Psychotherapeutic Intervention" by Breitbart et al. (2004) or "Meaning Making Intervention" by Lee et al. (2006), which focus on meaning of life or spirituality, may help patients. These focused interventions to these problems may be more needed in addition to life review interview in Japan.

Patients in the 70-year-old group talked about their resignation to death. They also reviewed and evaluated their lives in detail, and with great ease, suggesting that this may be a more normative process for them. It is considered that some people may not survive until they turn 70, and thus, they are more likely to think of their own death, believing that they might not live much longer after this age. This shows that life review was more suitable for this age group in this research.

For patients in the 80-year-old group, profound life review with evaluation is sometimes more difficult, as this group tends to forget various things and retain only the most impressive memories they had. They did not talk so much about children or spiritual pain. These patients part with various memories and often accept their mortality. One 80-year-old woman said, "I have forgotten most of them. Old times seem good but I do not remember them." For these people, structured life reviews with evaluation is sometimes not suitable, and simple reminiscence therapy (Coleman, 1974), in which a person reviews his or her good memories without deep evaluation, may be more suitable.

Next, we investigated the results of fragments separated into a combination between disease stage (anticancer treatment, terminal) and gender. Both men and women receiving treatment demonstrated reflection on their lives and new discoveries. Some patients had a renewed sense of gratitude to their family or reflected on their past behavior toward others. Illness had given them an opportunity to reflect upon their lives. From the viewpoint of a cultural aspect, Kubler-Ross (1969) described the psychological stage as "Transaction with God"; however, in Japanese culture, it is thought of as "Consideration for others" because consciousness of sin in the sight to God means very little to the Japanese, whereas harmony with others is the most important attitude they value. The clinician should help patients reevaluate their human relations or make good ones new.

The theme of children was common among men and women receiving anticancer treatments. Women were worried about their children and whether they understood their disease, whereas men hoped to pass on their values to their children. Generativity may have been stronger in men, who wanted to pass their values on to their children and were newly grateful to their family or realized their family bond, which they did not feel until they became ill. It may be, therefore, that illness provides Japanese men with a renewed appreciation of family and family life and a stronger desire to shape the values and future of their offspring.

In the terminal stage, men spoke in detail about confronting death, saying things like "I do not want to prolong death" or "I want to die without suffering." In contrast, women in this study showed interest in human relationships or resignation toward death. These suggest that the provision of information on how to confront death or a coping mechanism such as Lazarus and Folkman's (1988) may help reduce men's anxiety, whereas empathetic support for patients' voice about mortality will help women. Some patients said things such as "Everyone passes the road to death, I am very peaceful because I can meet my dead mother or dead old people in the heaven." Like these patients who believe in another world after death, Japanese often do not have a specific religion, but they seem to be more religious.

Comparison of words between those receiving anticancer treatments and those in the terminal stage of cancer showed that interests of patients receiving anticancer patients focused on treatments such as side effects, home care, treatments, or meals, whereas, in the terminal stage, interest seems to be focused more on value of human relationships, how to prepare for death, and resignation to their own mortality. These differences show the importance of many kinds of support, such as instrumental or emotional support, and clinicians need to prepare to talk about various ranges of interests.

Study Limitations and Conclusions

There are some limitations of the study, which was conducted in only two hospitals. Thus, it is difficult to generalize these results. Moreover, there are differences in the number of participants between men and women, the number of men being small. This is no surprise, however, because men do not like to talk about themselves in comparison to women

and refused to participate. Only a small number of patients met the criteria for entry to the study. In future research, we will examine these problems. However, although there are some limitations, the present study reinforced the need to carefully consider differing interests among ages, gender, and stages. Further study will be needed into the use of reminiscence therapy and the impact of variables in the appropriateness of different reminiscence techniques; but in general, the data presented here contain several developmental theories of aging and preparatory grief work.

REFERENCES

Ando, M., Tsuda, A., Moorey, S. (2006a). A preliminary study of life review therapy for terminal cancer patients. *Psychological Report, 98,* 339–346.

Ando, M., Tsuda, A., & Morita, T. (2007). Life review interviews on the spiritual well-being of terminally ill cancer patients. *Supportive Care in Cancer, 15,* 225–231.

Breitbart, W., Gibson, C., Poppito, S.R., et al. (2004). Psychotherapeutic interventions at the end of life: A focus on meaning and spirituality. *Canadian Journal of Psychiatry, 49,* 366–372.

Butler, R.N. (1974). Successful aging and the role of the life review. *Journal of American Geriatric Society, 22,* 529–535.

Chochinov, H.M., Hack, T., Hassard, T., et al. (2005). Dignity therapy: A novel psychotherapeutic intervention for patients near the end of life. *Journal of Clinical Oncology, 23,* 5520–5525.

Coleman, P.G. (1974). Measuring reminiscence characteristics from conversation as adaptive features of old age. *International Journal of Aging and Human Development, 5,* 281–294.

de Vries, B.D., Birren, J.E. & Deutchman, D.E. (1995). Method and uses of the guided autobiography. In *The Art and Science of Reminiscing: Theory, Research, Methods and Application,* Haight B.K. & Webster J.D. (eds.), pp. 165–177. Washington, DC: Taylor & Francis.

Haight, B.K. (1988). The therapeutic role of a structured life review process in homebound elderly subjects. *Journal of Gerontology, 43,* 40–44.

Haight, B., Coleman, P.G., & Lord, K. (1995). The linchpins of a successful life review: Structure, evaluation, and individuality. In *The Art and Science of Reminiscing: Theory, Research, Methods and Application,* Haight

B.K. & Webster J.D. (eds.), pp. 179–192. Washington, DC: Taylor & Francis.

Haight, B., Michel, Y., & Hendrix, S. (2000). The extended effects of the life review in nursing home residents. *International Journal of Aging and Human Development, 50,* 151–168.

Haight, B., Michel, Y., & Hendrix, S. (1998). Life review: Preventing despair in newly relocated nursing home residents: Short- and long-term effects. *International Journal of Aging and Human Development, 47,* 119–142.

Japan Information Processing Service. (2003). Word Miner, version 1.1, Tokyo: Japan Electronic Company.

Kitayama, O. (1999). *Amae wo Kanngaeru,* pp. 102–104. Tokyo: Seiwa Syoten.

Kubler-Ross, E. (1969). *On Death and Dying.* New York: Macmillan.

Lazarus, R.S. & Folkman, S. (1984). *Stress, Appraisal, and Coping.* New York: Springer Publishing Co.

Lee, V., Cohe, S.R., Edgar, L., et al. (2006). Meaning-making intervention during breast or colorectal cancer treatment improves self-esteem, optimism, and self-efficacy. *Social Science & Medicine, 62,* 3133–3145.

Morita, T., Kawa, M., Honke, M., et al. (2004). Existential concerns of terminally ill cancer patients receiving specialized palliative care in Japan. *Supportive Care in Cancer, 12,* 137–140.

Morohosi, M., Nasukawa, T., & Nagano, T. (1999). An application of text mining technology to call-takers' report. In the proceeding of *ISM Symposium on Data mining and Knowledge Discovery in Data Science, Organized by the Institution of Statistical Mathematics,* Tokyo, 127–136.

Ohsumi, N. (2006). Word Miner Case Studies. Tokyo: Japan Electronic Company.

Pickrel, J. (1989). Tell me your story: Using life review in counseling the terminally ill. *Death Study, 13,* 127–135.

Thornton, S. & Brotchie, J. (1987). Reminiscence: A critical review of the empirical literature. *British Journal of Clinical Psychology, 26,* 93–111.

Webster, J.D. (1993). Construction and validation of the reminiscence function scale. *Journal of Gerontology, 48,* 256–262.

Wholihan, D. (1992). The value of reminiscence in hospice care. *American Journal of Hospice & Palliative Care, 9,* 33–35.

Wong, T.P. & Watt, L.M. (1991). What types of reminiscence are associated with successful aging? *Psychology and Aging, 6,* 272–279.

Efficacy, Safety, and Cost Effectiveness of Intravenous Midazolam and Flunitrazepam for Primary Insomnia in Terminally Ill Patients with Cancer: A Retrospective Multicenter Audit Study

NAOKI MATSUO, M.D.[1] and TATSUYA MORITA, M.D.[2]

ABSTRACT

Background: Although intravenous midazolam and flunitrazepam are frequently administered for primary insomnia in Japan, there is no empirical study on their efficacy and safety.

Design and subjects: To compare the efficacy, safety, and cost-effectiveness of midazolam and flunitrazepam, a multicenter retrospective audit study was performed on 104 and 59 patients receiving midazolam and flunitrazepam, respectively, from 18 certified palliative care units.

Results: Median administration periods were 6 days and 9 days for midazolam and flunitrazepam, respectively. The median initial and maximum doses were 10 mg per night and 18 mg per night for midazolam, and 2 mg per night and 2 mg per night for flunitrazepam, respectively. There were no significant differences in the efficacy (91% in the midazolam group versus 81% in the flunitrazepam group, $p = 0.084$), hangover effect (34% versus 19%, $p = 0.094$), delirium at night (12% versus 10%, $p = 1.0$) and delirium next morning (11% versus 15%, $p = 0.33$), treatment withdrawal (4.8% versus 1.7%, $p = 0.41$), and treatment-related death (0% versus 0%, $p = 1.0$). Flunitrazepam caused respiratory depression defined as physician or nurses records such as apnea, respiratory arrest, decreased respiratory rate, and respiratory depression significantly more frequently than midazolam (17% versus 3.8%, $p = 0.0073$). The maximum dose was more highly correlated with the administration period in the midazolam group than in the flunitrazepam group ($\rho = 0.52$, versus $\rho = 0.39$), and, for patients treated for 14 days or longer, the daily escalation dose ratio required for maintaining adequate sleep was significantly higher in the midazolam group than in the flunitrazepam group (11% versus 2.6%, $p = 0.015$). The costs of the initial and maximum administration were significantly higher in the midazolam group than in the flunitrazepam group ($p < 0.001$).

Conclusion: Intravenous midazolam and flunitrazepam appeared to be almost equal about efficacy and safety for primary insomnia, but flunitrazepam is less expensive and shows lower risk of tolerance development. A future prospective comparison study is necessary.

INTRODUCTION

INSOMNIA IS A COMMON and highly distressing symptom in cancer patients[1-3] and a large proportion of terminally ill cancer patients receive hypnotics.[4,5] Although a considerable number of patients with cancer cannot take medications orally because of dysphagia or intestinal obstruction, there have been few empirical reports about treatment approaches when oral administration of a hypnotic drug becomes difficult. In

---

[1]Department of Palliative Care, Saitama Cancer Center, Ina-machi, Kitaadachigun, Japan.
[2]Department of Palliative and Supportive Care, Palliative Care Team and Seirei Hospice, Seirei Mikatahara General Hospital, Hamamatsu, Shizuoka, Japan.

Japan, the benzodiazepines used in parenteral routes are midazolam, flunitrazepam, and diazepam.

When the oral use of hypnotic medications becomes difficult with the progression of the underlying disease, neither intravenous bolus doses nor subcutaneous infusion but an intravenous drip of midazolam or flunitrazepam dissolved in 100 mL normal saline is traditionally administered in Japanese palliative care units. In our previous nationwide survey,[6] intravenous midazolam for insomnia was used in 89 institutions (79%) and intravenous flunitrazepam for insomnia in 59 institutions (53%). Western literature[7] reports that the subcutaneous route is the most preferred route of choice for the palliative care population. In Japan, as well as some other countries,[8-9] however, the majority of patients and families in palliative care units prefer the intravenous route, which is therefore frequently used to administer hypnotics in Japan.

On the other hand, benzodiazepines are often used to palliate serious symptoms refractory to standard palliative care, such as agitated delirium, dyspnea, pain and seizures in addition to procedural sedation.[10-18] Midazolam has a favorable therapeutic profile in palliative care settings, including a short half-life, no active metabolites, water soluble, and available intravenously or subcutaneously.

On the other hand, few empirical studies have demonstrated the treatment effects of parenteral flunitrazepam.[10,11] Subcutaneous flunitrazepam is not recommended because of skin irritation, and may have hangover effects resulting from its longer half-life. One of the problems in using intravenous benzodiazepines is complications such as a hangover effect[19] (residual sleepiness and impairment of psychomotor and cognitive functioning during the day), delirium, and respiratory depression.[20] Prevention of the hangover effect and delirium is important, because clear consciousness is generally desired in the terminal stage[21-23] and respiratory effects resulting in unexpected death may increase when patients are elderly or weak.

In addition, tolerance related to the long-term administration of midazolam was reported in palliative care[14-15,20,24] and intensive care units.[25-27] In contrast, there is little information about tolerance to flunitrazepam.

To date, there has been no report of treatment when the oral use of hypnotics is difficult. A comparison of oral midazolam with oral flunitrazepam for preoperative medication[28] and insomnia[29] has been reported; however, there has been no report comparing the evaluation of these two intravenous benzodiazepines. Before conducting a prospective study, we performed a retrospective chart review to compare the usefulness of these intravenous benzodiazepines for insomnia.

The aims of this multicenter study were therefore to compare the efficacy, safety, and cost effectiveness of these intravenous benzodiazepines in terminally ill cancer patients with primary insomnia.

PATIENTS AND METHODS

This is a retrospective preliminary study for subsequent prospective audit multicenter trials.

Patients

Eighteen certified palliative care units participated in this study.

In all institutions, we enrolled consecutive terminally ill patients with cancer who received an intravenous infusion of midazolam or flunitrazepam via a peripheral or central vein for primary insomnia before July 2005. Primary insomnia was defined as sleeplessness not attributable to a medical, psychiatric, or environmental cause by *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*. Indications other than primary insomnia, such as delirium and sedation for refractory symptoms such as dyspnea and pain, were excluded. We requested the enrollment of at most 10 consecutive patients in each institution because of large variations in the number of patients who received midazolam and flunitrazepam.[6]

Methods

This is a multicenter retrospective study based on chart review. In each institution, representative physicians completed the chart review using a structured data-collecting sheet designed for this study. The background data obtained included patient characteristics (age, gender, and primary site), other medications for insomnia, the duration from initial administration to death, the administration period, initial and maximum doses of midazolam or flunitrazepam, the administration method and cost. The cost was defined as market drug cost per day.

Measurements

Because of a lack of validated measurement tools, we evaluated efficacy and safety using ad hoc criteria on the day of initial administration (Appendix A). We designed evaluation methods to strictly follow the actual chart descriptions to minimize bias from retro-