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Nationwide Japanese survey about deathbed visions: “My deceased mother took me to heaven”

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#### **Conflict of interest statement**

This study was funded by the Japan Hospice Palliative Care Foundation in Japan. The authors have no conflicts of interest.

**Purpose:** Primary aim was to clarify the prevalence and factors associated with the occurrence of deathbed visions, explore associations among deathbed visions, a good death, and family depression. Additional aim was to explore the emotional reaction, perception, and preferred clinical practice regarding deathbed visions from the view of bereaved family members.

**Methods:** A nationwide questionnaire survey was conducted involving 3,964 family members of cancer patients who died at hospitals, palliative care units, and home.

**Results:** A total of 2,827 responses (71%) were obtained, and finally 2,221 responses were analyzed. Deathbed visions were reported in 21% (95% confidence intervals, 19-23; n=463). Deathbed visions were significantly more likely to be observed in older patients, female patients, female family members, family members other than spouses, more religious families, and families who believed that the soul survives the body after death. Good death scores for the patients were not significantly different between the families who reported that the patients had experienced deathbed visions and those who did not, while depression was more frequently observed in the former than latter, with marginal significance (20 vs. 16%, respectively, adjusted  $P=0.068$ ). While 35% of the respondents agreed that deathbed visions were hallucinations, 38% agreed that such visions were a natural and transpersonal phenomenon in the dying process; 81% regarded it as necessary or very necessary for clinicians to share the phenomenon neutrally, not automatically labeling them as medically abnormal.

**Conclusions:** Deathbed vision is not an uncommon phenomenon. Clinicians should not automatically regard such visions as an abnormal phenomenon to be medically treated, and rather provide an individualized approach.

**Keywords:** end-of-life, family, experience, delirium, deathbed vision

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Deathbed vision is an end-of-life experience commonly observed throughout the world<sup>1,2</sup>, but very few systematic studies have been reported in peer-reviewed journals<sup>3-11</sup>. The Grotto painting of the 15 century Assisi tells the story of a dying monk who experienced a vision of the deceased Saint Francis<sup>2</sup>. From 1926 to 1977, Osiris K published pioneering studies of deathbed visions in dying patients across many cultures<sup>2</sup>. Through several empirical observations, Fenwick P proposed a concept of transpersonal end-of-life experience and the final meaning of end-of-life experience<sup>3</sup>. The former includes deathbed visions (e.g., visions of deceased persons) and deathbed coincidence (e.g., clocks stopping, animal behaviors); and the latter includes a brief recovery of lucidity to help the patients and families settle unresolved matters<sup>3</sup>. They stress that, although medical professionals often regard such a phenomenon as meaningless or harmful symptoms, the phenomenon itself has therapeutic value and, thus, it is of importance for clinicians caring for dying patients to understand the nature of deathbed visions<sup>1-11</sup>.

In preliminary small-sample studies, deathbed visions were observed in 50 to 60%, and were typically associated with feelings of comfort of patients and families<sup>3-11</sup>. Some researchers stress that deathbed visions are different from hallucinations due to delirium, because in hallucinations patients usually see animals or insects, and feel anxious or agitated; in deathbed visions, patients see the deceased with comfortable feelings and are often mentally lucid. In some cases, not only patients themselves but also healthcare professionals or family caregivers see the visions. On the other hand, some studies on families of terminally ill patients with delirium reported that patients sometimes see the deceased during episodes of delirium<sup>12,13</sup>. Existing studies are, however, mainly based on views of healthcare professionals<sup>3-7</sup>; and only one study was performed on patients<sup>8</sup>, and three small studies were performed on families<sup>9-11</sup>. A recent Japanese single-center study on 575 bereaved families of patients receiving a home hospice service revealed that 39% reported their loved patients experiencing deathbed visions, termed *Omukae* in Japanese (literally, someone visiting a dying patient to accompany them on death's journey)<sup>14</sup>.

Understanding what the families experienced through deathbed visions could be of importance, given that pioneering literature suggested that this phenomenon is not uncommon and is a subjectively meaningful event<sup>3-11</sup>. A large study is required to explore the following research questions: how often do deathbed visions occur? What factors contribute to the occurrence of deathbed visions? Is the prevalence of deathbed visions different among locations patients are dying (e.g., hospital vs. home)? How do families and patients feel to see the deathbed visions, comfortable or scared? Are deathbed visions associated with a patient's good death? How do families regard deathbed visions, such as hallucinations or meaningful episodes to prepare for death? Is the experience of deathbed visions associated with family grief outcomes? What is the preferred clinical practice from the view of family members to face deathbed visions?

The primary aims of this study were: 1) to clarify the prevalence and factors associated with the occurrence of deathbed

visions on a large bereaved family sample, 2) to explore the potential association between deathbed visions and a patient's good death and family depression. Additional aim was to explore the emotional reaction, perception, and preferred clinical practice regarding deathbed visions from the view of bereaved family members.

This was a nationwide survey of bereaved family members of cancer patients to evaluate quality of end-of-life care across Japan: the Japan Hospice and Palliative care Evaluation study (J-HOPE3)<sup>15</sup>. A multicenter questionnaire survey was conducted involving bereaved family members of cancer patients who died at hospital, palliative care units, or home. We mailed questionnaires to bereaved families in May 2014, and again in June 2014 to non-responding families. The completion and return of the questionnaire was regarded as consent to participate in this study, and families who did not want to participate were asked to return the questionnaire with “no reply”. Ethical and scientific validity was confirmed by the institutional review board of all participating institutions.

### Settings and Subjects

Participating institutions were recruited from those belonging to the Japan Hospice Association. From all 321 certified palliative care units in Japan, 296 belonged to the association; of those, 133 agreed to participate in this survey. There were no national registries of hospitals or home hospice services in Japan; among all 49 hospitals and 51 home hospice services belonging to the association, 20 and 22, respectively, agreed to participate in this survey.

Primary physicians identified potential participants following the inclusion criteria: 1) bereaved family members of an adult cancer patient (one family member was selected for each patient), 2) aged 20 or older, 3) capable of replying to a self-reported questionnaire, and 5) aware of the diagnosis of malignancy. Exclusion criteria included: 1) inability to complete the questionnaire (dementia, cognitive failure, psychiatric illness, language difficulty, or visual loss), 2) treatment-associated death or death in intensive care units, 3) family member unavailable, 4) receiving palliative care services less than 3 days, and 5) no serious psychological distress recognized by the primary physician. The final criterion was, as in our previous studies<sup>15-17</sup>, adopted on the assumption that primary physicians could identify families who may suffer a serious psychological impact due to the present study, and no formal criteria or psychiatric screening was applied. Families were surveyed 6 to 12 months after the patients' deaths.

### Measurements

The questionnaire was developed by the authors on the basis of a literature review and local preliminary surveys<sup>3-14</sup>. To avoid a lack of clarity for responding families, we focused our questions on deathbed visions, not expanding to broader end-of-life experiences such as deathbed coincidence. We defined deathbed visions as visions of deceased persons or afterlife scenes<sup>3</sup>. Afterlife scenes were defined as an afterlife world (celestial landscape, heaven, fields of flowers), the presence of a border (river, tunnel, bridge), God/Buddha, or light<sup>3, 18, 19</sup>. Sensitivity analyses were *a priori* scheduled for different definitions.

#### *Deathbed visions*

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We asked the respondents whether the patients did or did not clearly say they saw deceased persons or scenes of the afterlife during the last 2 weeks. Possible choices included yes (patients themselves clearly stated so), yes (patients did not clearly state so but the family witnessed it), no, and unsure. We regarded deathbed visions as present if families reported either of the former two answers. We specified the periods for family recall as 2 weeks for clarification. For the respondents who agreed that the patients saw visions of deceased persons, we asked the families to identify them from the mother, father, siblings, a child, spouse, grandmother/grandfather, other family members, friend, pets, or others; for those who agreed that the patients saw afterlife scenes, we asked the families to identify them from scenes of the afterlife, the presence of borders, God/Buddha, the light, or others. Others items were divided into existing items, and responses inconsistent with prepared options were excluded. Additionally, families were asked whether they did or did not talk about their experience to other family members, physicians, nurses, or professional care workers.

### *Good death*

Quality of death and dying was evaluated using the Good Death Inventory<sup>20, 21</sup>. This was developed to represent important concepts relating to a good death, and has 10 subscales: physical and psychological comfort, living in a favorite place, maintaining hope and pleasure, a good relationship with medical staff, not feeling a burden to others, a good relationship with the family, independence, environmental comfort, being respected as an individual, and a feeling of fulfillment at life completion. Reliability and validity were confirmed<sup>15, 16, 20</sup>. The comfort domain includes 3 items: free from pain, free from physical distress, and psychological distress. Bereaved family members rate the patient's quality of death and dying in their final place of care using a 7-point Likert-type scale, with higher values indicating a higher quality of death and dying.

### *Mental health of the bereaved families*

We measured depression of the bereaved family members using PHQ-9<sup>22, 23</sup>. The reliability and validity of the Japanese version of both scales were confirmed, and we adapted a score of 10 to indicate clinical depression<sup>22, 23</sup>.

### *Emotional reaction, perceptions, and preferred clinical practice*

We also asked the respondents to rate the level of agreement with 4 statements about emotional reactions of families and patients on a 5-point Likert type scale from 1: strongly disagree to 5: strongly agree (i.e., scared or anxious, comfortable or reassured). Moreover, we asked the respondents to rate the level of agreement with 3 statements about family perception of deathbed visions on a 5-point Likert type scale from 1: strongly disagree to 5: strongly agree; and 3 statements about preferred care from medical professionals on a 3-point Likert type scale from 1: unnecessary to 3: very necessary (Table 5).

As covariates, we asked family members to report the following demographic data: patient age; sex; tumor sites; income



(low, <8 million yen/year vs. high, ≥8 million yen/year); living area (urban, ≥300,000 population vs. rural, <300,000 population); family age; sex; relationship to patients; the periods family members stayed with the patients during the last week; education (high, university or graduate school vs. low, others); religion; frequency of visiting a temple, church, or other religious places (regularly, often vs. rarely, none); and agreement with the statement that the soul survives the body after death (on a 4-point Likert type scale, disagree to agree).

### Statistical analyses

We initially calculated the frequency with 95% confidence intervals for the prevalence of deathbed visions for the total sample. To identify the factors associated with the family-reported occurrence of deathbed visions, we compared demographic data using the univariate logistic regression analysis. Multivariate analyses were not performed.

The potential association between deathbed visions and patients' good death was assessed by comparing the total score and comfort subscale score of the Good Death Scale between the respondents with and without deathbed visions. Comparisons were performed using Student's t-test, and adjusted for all background demographic data by regression analyses. The potential association between deathbed visions and family depression was assessed by comparing the prevalence of depression (i.e., PHQ9 score of 10 or more), and adjusted for all background demographic data by regression analyses.

To explore emotional reactions, perceptions, and preferred clinical practice, we divided the responses into several categories and calculated the frequency of each item. For additional analyses, we explored sex-related differences regarding the contents of deathbed visions (e.g., whether male patients saw their mothers more frequently than female patients), and demographic factors significantly related to the belief that deathbeds visions were one of the natural and transpersonal phenomena.

As a sensitivity analyses, all analyses were performed on the basis of two definitions: deathbed visions were defined as visions of either deceased persons or afterlife scenes; and defined as visions of only deceased persons. Both analyses obtained essentially the same results, and we presented the results on the basis of the first definition (results of the latter definition are available as Web materials). In another sensitivity analysis where deathbed visions was regarded as present only when patients themselves clearly stated, the results were essentially the same.

A P-value of 0.050 was regarded as significant. All analyses were performed using the Statistical Package for the Social Sciences (ver. 11.0).

A total of 4440 family members met the inclusion criteria, but 478 were excluded (Figure 1). We sent 3,964 questionnaires, and 2,827 (71%) were returned. Of them, 348 refused to reply. For the present study, 147 responses were excluded due to missing data on the primary end-points, and 111 responses were excluded because they reported “patients had deathbed visions” but contents reported in the “others” category were inconsistent with the definitions (e.g., insects, funeral/grave, unknown persons, shoulders/war, sea/mountain, and out-of-body experience). We thus analyzed a total of 2,221 responses (79% of the obtained data). Background characteristics are summarized in Table 1. There were significant differences in patient age, living area, family sex, relationship to patients, the periods family members stayed with the patients, education, religion, and the belief about the soul after death.

### **Prevalence of deathbed visions**

Deathbed visions were reported in 21% (95% confidence intervals, 19-23; n=463) in total. Of those, 351 families stated that patients themselves clearly described them, 113 families stated that patients did not clearly state so but the family witnessed them, 1,392 families replied no, and the remaining 365 families replied that they were unsure.

Contents of deathbed visions are summarized in Table 2. Each patient had a median of 2 contents (range, 1-7). Of patients with deathbed visions, 87% had visions of deceased persons, and 54% had visions of afterlife scenes. Among the deceased persons, parents were most frequently listed, followed by siblings and friends. There were no significant sex-related differences in the contents of deathbed visions (data not shown). Families reported that they talked about their experience to other family member (83%, n=384), while they less frequently talked to physicians (16%, n=76), nurses (20%, n=92), and professional care workers (5.0%, n=23). A total of 12% of the families (n=54) reported they did not talk about their experience to anyone.

### **Factors associated with family-reported occurrence of deathbed visions**

Deathbed visions were significantly more likely to be observed in older patients, female patients, female family members, family members other than spouses, families with more religious activities, and families who believed the soul survive the body after death (Table 3).

### **Association between deathbed visions and patients’ good death and family depression**

Good death scores were not significantly different between the families who reported the patients experienced deathbed visions and those who did not (Table 3). Depression was more frequently observed in the families who reported the patients experienced deathbed visions compared those who did not, with marginal significance (20%, 95% confidence intervals=16-25 vs. 16%, 95% C.I.=16-19; Table 4).

The proportions of the respondents who reported deathbed visions as causing fear were 19% for patients and 22% for families; while the proportions of the respondents who reported deathbed visions as comfortable were 24% for patients and 13% for families (Table 5). While 35% of the respondents agreed that deathbeds visions were hallucinations due to impaired general conditions, 38% agreed that deathbed visions were one of the natural and transpersonal phenomena (Table 5). Female family members and those with a belief that the soul survives the body after death were significantly more likely to agree that deathbed visions were natural and transpersonal phenomena (male, 26% vs. female, 45%,  $P<0.001$ ; belief, 44% vs. non-belief, 26%,  $P<0.001$ ). About 80% of the respondents regarded it as necessary or very necessary for clinicians to share the phenomena neutrally, and use psychotropics if a patient was distressed due to the deathbed visions. Less than 30% of the respondents regarded pastoral care as necessary (Table 5).

This is, to our knowledge, the first large-scale study on bereaved family members to systemically investigate deathbed visions. The strengths of this study were its large sample size of a nationwide population at home, inpatient hospices, and acute care hospitals, relatively high response rates, and the use of validated measurement tool of good death and depression.

The first important finding of the present study was clarification of the estimated prevalence of deathbed visions. In this study, deathbed visions were observed in about 20% of the patients. Previous studies demonstrated a variety of prevalence: 43% of clinicians experienced deathbed phenomena per year<sup>3</sup>, a hospice nurse encountered a median of 4.8 patients with deathbed visions per month<sup>5</sup>, 88% of terminally ill patients with a median survival of 15 days reported that they had at least one vision or dream related to deceased persons<sup>8</sup>, and 36% of bereaved families reported that dying patients had deathbed visions different from hallucinations<sup>10</sup>. In all studies, the core concept of deathbed visions is the same, but target subjects (clinicians, patients, and families), study methods (interview and questionnaire survey), periods of investigation (a day, whole trajectory, and specific periods: 2 weeks in this study), and operational definition are inconsistent. A direct comparison of existing studies, therefore, is of less value; however, these studies indicate that deathbed visions are not uncommon in the world.

Whether or not patients and families are comfortable with deathbed visions is a focus of research<sup>1-11</sup>. Previous studies emphasized that deathbed visions are generally comfortable experiences for patients and families<sup>1-11</sup>, and some researchers regarded this as a distinct difference between deathbed visions and hallucinations<sup>2</sup>. The literature suggests that 50-80% of clinicians agreed with the opinion that deathbed visions offered comfort for patients, and that patients who experienced deathbed visions achieved a peaceful death<sup>3</sup>; 51% reported being happy to see “visitors”<sup>4</sup>; and visions of deceased were more comforting than visions of living persons for patients themselves<sup>8</sup>. In this study, there were no significant differences in good death scores including the comfort subscale, but rather there was a slightly higher tendency of depression in families with experience of deathbed visions. The responses to unvalidated questions directly asking if deathbed visions were feared or comfortable were divisive: feared in about 20% vs. comfortable in about 20% of patients and families. This inconsistency may come from the possibility that families might recall a variety of episodes and not isolate “pure” deathbed visions from other similar episodes, especially delirium<sup>12, 13, 24-26</sup>. Depression or grief is a complex process and a single factor such as a deathbed vision could not explain the development of post-bereavement depression<sup>27</sup>. This study nonetheless highlights that deathbed visions are not distressing phenomena for all patients and families, and some regard them as transpersonal phenomena in the dying process, not hallucinations, consistent with previous preliminary studies<sup>3-11</sup>. Clinicians should not automatically regard deathbed visions as abnormal phenomena to be medically treated, and an individualized approach is strongly needed.

The findings that the contents of deathbed visions were mostly related to deceased persons, not religious figures, and that

patients and families were reluctant to talk about this to healthcare professionals confirmed earlier observations<sup>3,4</sup>. Factors associated with the development of deathbed visions identified in this study, such as an older age and stronger religious beliefs, is reasonable; and future studies should confirm these findings.

This study has several large limitations. Firstly, although we had made maximum efforts to define deathbed visions as clearly as possible, interpretation might be different among respondents. This is, we believe, an acceptable limitation because there is no universally accepted operational definition of deathbed visions. As using different definitions might lead to different results, consensus regarding the operational definition of deathbed visions is strongly needed in future studies. Secondly, this study involved a bereaved family survey substantially long periods after patient death (6 months after), and so recall and proxy bias cannot be avoided. This study design, however, has a unique merit in obtaining family outcomes, such as depression or a validated measure of a patient's quality of death and dying very close to death. This study applied only quantitative study design, and deathbed visions should be further understood through a variety of research methods, including patient interview or ethnography studies. Thirdly, primary physicians identified potential participants, and there might be a selection of family members of deceased patients. This study was performed in a Japanese population, and so generalizability of the findings to other cultures needs caution.

In conclusion, deathbed visions are not uncommon phenomena. Clinicians should not automatically regard such visions as abnormal, and an individualized approach is needed.

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Table 1 Respondents' characteristics (n=2221)

	Total N (%)	Hospital	Palliative care units	Home	P
Patients					
Age (mean, standard deviation)*	72.9 (12)	70.4 (12)	74.3 (11)	74.0 (12)	<0.001
Sex					0.15
Male	1276 (58)	431 (60)	315 (55)	530 (57)	
Female	936 (42)	284 (40)	259 (45)	393 (43)	
Primary tumor sites					0.095
Lung	473 (21)	145 (20)	134 (23)	194 (21)	
Liver, bile duct, pancreas	454 (20)	135 (19)	121 (21)	198 (22)	
Stomach, esophagus	325 (15)	98 (14)	87 (15)	140 (15)	
Colon, rectum	267 (12)	89 (12)	58 (10)	120 (13)	
Prostate, kidney, bladder	163 (7.3)	47 (6.4)	43 (7.3)	73 (8.0)	
Breast	128 (5.8)	59 (8.3)	24 (4.1)	45 (4.9)	
Uterus, ovary	109 (4.9)	39 (5.5)	33 (5.7)	37 (4.0)	
Head and neck, brain	99 (4.5)	31 (4.3)	30 (5.2)	38 (4.1)	
Blood	84 (3.8)	34 (4.8)	18 (3.1)	32 (3.5)	
Others	112 (5.0)	38 (5.3)	33 (5.7)	41 (4.5)	
Income					0.11
High	1,947 (93)	632 (93)	516 (95)	799 (92)	
Low	153 (7.3)	49 (7.2)	30 (5.5)	74 (8.5)	
Living area					<0.001
Urban	951 (48)	245 (38)	235 (44)	471 (57)	
Rural	1045 (52)	402 (62)	294 (56)	349 (43)	
Families					
Age (mean, standard deviation)*	61.9 (12)	62.1 (12)	61.7 (12)	62.0 (12)	0.83
Sex					<0.001
Male	681 (31)	258 (37)	186 (32)	237 (26)	
Female	1,510 (69)	445 (63)	391 (68)	674 (74)	
Relationship with patients					<0.001
Spouse	1,151 (52)	408 (58)	267 (46)	476 (52)	
Child	724 (33)	199 (28)	206 (36)	319 (35)	



Siblings	90 (4.1)	37 (5.2)	37 (6.4)	16 (1.7)	
Parents	52 (2.4)	21 (3.0)	8 (1.4)	23 (2.5)	
Others	188 (8.5)	45 (6.3)	62 (11)	81 (8.9)	
Stay with patients during the final week					<0.001
4 days or more	1,916 (87)	593 (84)	466 (81)	857 (94)	
Less than 4 days	282 (13)	117 (17)	112 (19)	53 (5.8)	
Education					<0.001
High	898 (41)	242 (35)	234 (41)	422 (47)	
Low	1276 (59)	459 (66)	332 (59)	485 (54)	
Religion					0.013
None	778 (36)	245 (35)	226 (40)	307 (34)	
Buddhism	1,224 (56)	408 (58)	306 (54)	510 (56)	
Christianity	43 (2.0)	5 (0.7)	12 (2.1)	26 (2.9)	
Others	131 (6.0)	41 (5.9)	28 (4.9)	62 (6.9)	
Frequency of visiting religious places					0.34
Often or regularly	1,514 (69)	494 (70)	384 (67)	636 (70)	
Rarely or never	670 (31)	212 (30)	190 (33)	268 (30)	
Belief that the soul survives the body after death**					0.041
Agree	1,509 (70)	490 (70)	372 (66)	647 (72)	
Disagree	657 (30)	207 (30)	195 (34)	255 (28)	

#### Legend for Table 1

Percentages (numbers) are presented. \*: mean (standard deviations) \*\*: Rated on a 4-point Likert scale from agree to disagree.

Some data do not add up to 100% due to missing values.

Table 2 Contents of death visions (n=464)

ACCEPTED MANUSCRIPT		
Contents	%	N
Deceased persons	87	403
Parents	67	310
Mother	38	177
Father	29	133
Siblings	24	113
Child	11	52
Spouse	8.6	40
Grandmother/grandfather	1.3	6
Other family members	4.3	20
Friends	16	76
Pets	1.7	8
Afterlife scene	54	250
Afterlife world	19	88
Presence of border	13	59
God/Buddha	9.7	45
The light	7.1	33

Table 3 Factors associated with occurrence of deathbed visions

ACCEPTED MANUSCRIPT

Variables	Odds ratio	95% confidence intervals	P
Death locations			
Hospital	1.0 (reference)		
Palliative care units	1.0	0.80-1.4	0.74
Home	1.1	0.89-1.4	0.32
Patient characteristics			
Patient age			
≤69	1.0 (reference)		
70-89	1.5	1.2-1.9	<0.001
90≤	2.5	1.6-3.8	<0.001
Patient sex			
Male	1.0 (reference)		
Female	1.3	1.0-1.6	0.020
Primary tumor sites			
Lung	1.0 (reference)		
Stomach, esophagus	1.0	0.73-1.5	0.85
Colon, rectum	1.1	0.76-1.6	0.62
Liver, bile duct, pancreas	1.3	0.94-1.8	0.11
Breast	1.2	0.76-1.9	0.42
Prostate, kidney, bladder	1.0	0.65-1.6	0.96
Uterus, ovary	0.7	0.40-1.3	0.25
Head and neck, brain	1.0	0.61-1.8	0.86
Blood	0.97	0.54-1.8	0.93
Others	1.4	0.85-2.2	0.19
Income			
Low	1.0 (reference)		
High	1.0	0.70-1.6	0.86
Living area			
Rural	1.0 (reference)		
Urban	0.9	0.73-1.1	0.36
Family characteristics			
Family age			
≤49	1.0 (reference)		
50-60	0.90	0.68-1.2	0.47
60≤	0.76	0.55-1.1	0.091
Family sex			
Male	1.0 (reference)	1.1-1.7	0.007
Female	1.4		
Relationship with patients			
husband/wife	1.0 (reference)		
child	1.4	1.1-1.8	0.004
siblings, parents, others	1.5	1.1-2.0	0.006
Stay with patients during the final week			

Less than 4 days	1.0 (reference)	0.98-1.9	0.066
4 days or more	1.4		
Education			
Low	1.0 (reference)	0.79-1.2	0.86
High	0.98		
Religion			
None	1.0 (reference)		
Buddhism	0.88	0.71-1.1	0.27
Christianity	0.81	0.37-1.8	0.60
Others	1.1	0.71-1.7	0.67
Frequency of visiting religious places			
Rarely or never	1.0 (reference)	1.2-2.0	<0.001
Often or regularly	1.6		
Belief that the soul survives the body after death			
Disagree	1.0 (reference)	1.2-1.9	0.001
Agree	1.5		

Table 4 Association between deathbed visions and patient's good death and family's depression

ACCEPTED MANUSCRIPT

	With deathbed visions (n=464)	Without deathbed visions (n=1757)	P	Adjusted P
Good death				
Total score (mean, standard deviation)	4.8 (0.92)	4.7 (0.9)	0.46	0.80
Comfort subscale (mean, standard deviation)	5.0 (1.4)	5.0 (1.4)	0.28	0.94
Depression (% , n)	20% (n=92)	16% (n=281)	0.058	0.068

## Legend for Table 4

Good death was measured using the Good Death Inventory, with a higher score indicating a higher quality of death and dying, ranging from 1-7. Depression was measured by PHQ9. P-values were adjusted by patient age, sex, primary tumor sites, patient income, living area, family age, sex, relationship to patients, periods family members stayed with the patients during the last week, education, religion, frequency of visiting a religious place, and belief that soul survive the body after death .

Table 5 Family emotional reaction, perception, and preferred practical practice

ACCEPTED MANUSCRIPT

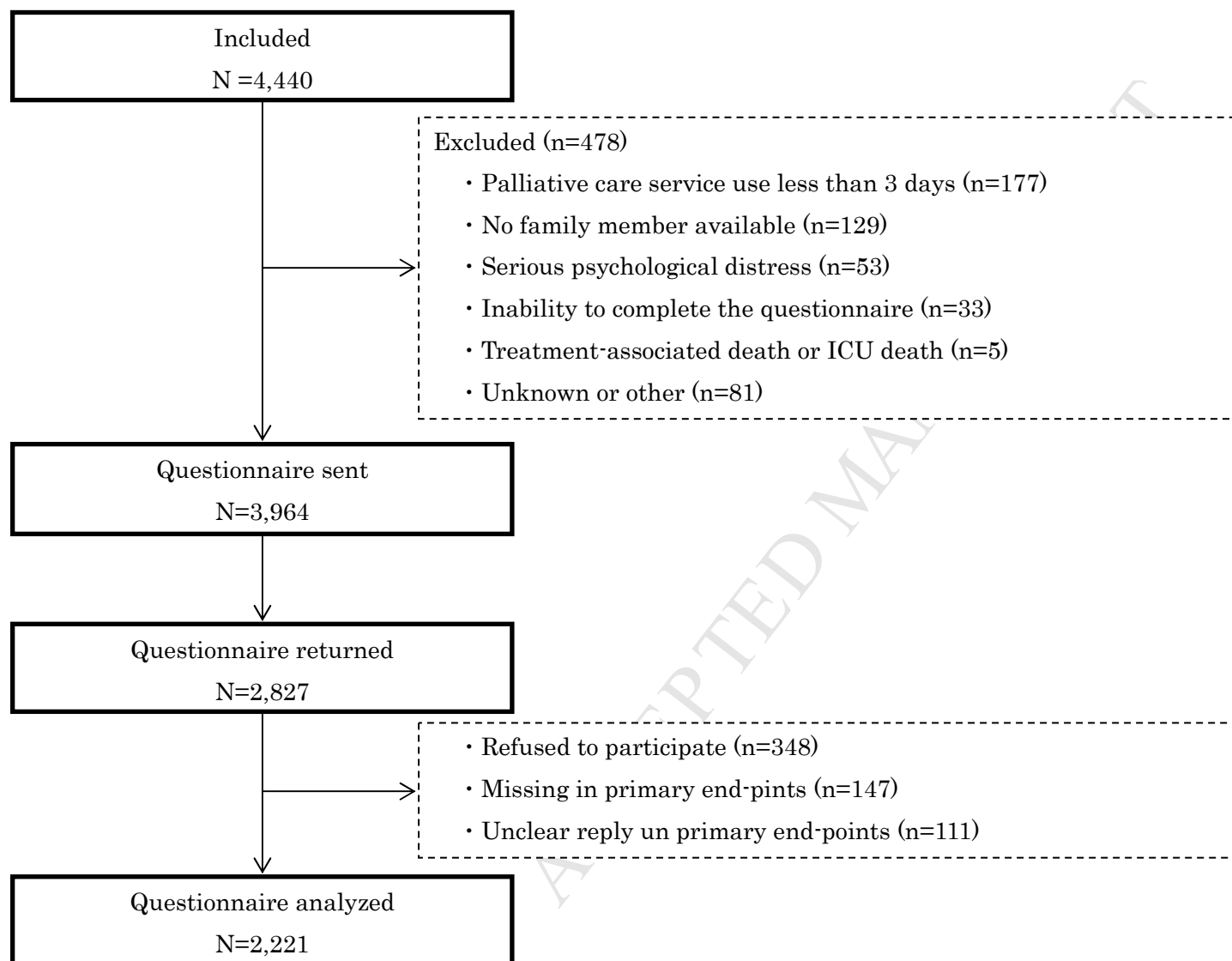
Emotional reaction and perception	Strongly agree or agree	Unsure	Disagree or strongly disagree
Emotional reaction*	% (n)		
Patients			
Seemed to be scared, or anxious	19 (88)	27 (123)	47 (220)
Seemed to be comfortable or reassured	24 (111)	40 (185)	30 (138)
Families			
Scared or anxious	22 (103)	19 (89)	52 (240)
Comfortable or reassured	13 (58)	34 (159)	45 (208)
Perceptions*			
Deathbed visions were hallucinations due to medications	25 (114)	24 (112)	45 (207)
Deathbed visions were hallucinations due to impaired general conditions	35 (162)	23 (105)	36 (165)
Deathbed visions were one of natural and transpersonal phenomena in the dying process	38 (174)	27 (124)	30 (140)
Preferred practical practice**	Unnecessary	Necessary	Very necessary
Share the phenomenon neutrally, not automatically labeling as medically abnormal	18 (81)	54 (251)	24 (111)
Use psychotropics, if patient was distressed due to deathbed visions	12 (57)	60 (280)	23 (105)
Coordinate to receive pastoral care	66 (304)	21(99)	5 (23)

## Legend for Table 5

Percentages with numbers in parentheses are shown. \*: Responses of agree or strongly agree on a 5-point Likert type scale.

\*\*: Responses of necessary or strongly necessary on a 3-point Likert type scale.

Figure 1 Recruitment of participants



(Number in preintervention survey, number in postintervention survey)

**Legend for Web material**

The same analyses were performed on the respondents on the basis of definitions of deathbed visions as visions of only deceased persons. Analyses obtained essentially the same results.

eTable 1 Respondents' characteristics (n=2,160)

	Total N (%)	Hospital	Palliative care units	Home	P
<b>Patients</b>					
Age (mean, standard deviation)*	72.9 (12)	70.4 (12)	74.2 (11)	74.1 (12)	<0.001
<b>Sex</b>					
					0.20
Male	1236 (58)	418 (60)	306 (55)	512 (57)	
Female	915 (42)	278 (40)	249 (45)	388 (43)	
<b>Primary tumor sites</b>					
					0.20
Lung	461 (21)	141 (20)	131 (23)	189 (21)	
Liver, bile duct, pancreas	440 (20)	132 (19)	117 (21)	191 (21)	
Stomach, esophagus	310 (14)	96 (14)	82 (15)	132 (15)	
Colon, rectum	264 (12)	88 (13)	58 (10)	118 (13)	
Prostate, kidney, bladder	157 (7.3)	44 (6.3)	41 (7.3)	72 (8.0)	
Breast	127 (5.9)	58 (8.3)	24 (4.3)	45 (5.0)	
Uterus, ovary	107 (5.0)	37 (5.3)	33 (5.9)	37 (4.1)	
Head and neck, brain	94 (4.4)	29 (4.2)	27 (4.8)	38 (4.2)	
Blood	83 (3.9)	33 (4.7)	18 (3.2)	32 (3.6)	
Others	110 (5.1)	38 (5.5)	31 (5.5)	41 (4.6)	
<b>Income</b>					
					0.072
High	1,891 (93)	617 (93)	498 (95)	776 (91)	
Low	148 (7.3)	45 (6.8)	29 (5.5)	74 (8.7)	
<b>Living area</b>					
					<0.001
Urban	925 (48)	240 (38)	228 (44)	457 (57)	
Rural	1,015 (52)	389 (62)	285 (56)	341 (43)	
<b>Families</b>					
					0.74
Age (mean, standard deviation)*	62.0 (12)	62.2 (12)	61.7 (12)	62.1 (12)	



Sex	ACCEPTED MANUSCRIPT				<0.001
Male	668 (31)	252 (37)	182 (33)	234 (26)	
Female	1,462 (69)	432 (63)	376 (67)	654 (74)	
Relationship with patients					<0.001
Husband/wife	1,117 (52)	397 (58)	258 (46)	462 (52)	
Child	708 (33)	194 (28)	199 (36)	315 (35)	
Siblings	89 (4.2)	37 (5.4)	36 (6.4)	16 (1.8)	
Parents	49 (2.3)	20 (2.9)	7 (1.2)	22 (2.5)	
Others	181 (8.4)	43 (6.2)	61 (11)	77 (8.6)	
Stay with patients during the final week					<0.001
4 days or more	1,858 (87)	576 (84)	447 (80)	835 (94)	
Less than 4 days	279 (13)	115 (17)	112 (20)	52 (5.9)	
Education					<0.001
High	877 (42)	236 (35)	227 (41)	414 (47)	
Low	1236 (58)	446 (66)	320 (59)	470 (54)	
Religion					0.014
None	756 (36)	235 (35)	220 (40)	301 (34)	
Buddhism	1,189 (56)	399 (59)	294 (53)	496 (56)	
Christianity	42 (2.0)	5 (0.7)	11 (2.0)	26 (2.9)	
Others	128 (6.0)	41 (6.0)	28 (5.1)	62 (6.7)	
Frequency of visiting religious places					0.40
Often or regularly	1,467 (69)	478 (70)	371 (67)	618 (70)	
Rarely or never	656 (31)	209 (30)	184 (33)	263 (30)	
Belief that the soul survives the body after death**					0.056
Agree	1,462 (70)	475 (70)	359 (66)	628 (72)	
Disagree	643 (30)	203 (30)	189 (34)	251 (28)	

#### Legend for eTable 1

Percentages (numbers) are presented. \*: mean (standard deviations) \*\*: Rated on a 4-point Likert scale from agree to disagree.

Some data do not add up to 100% due to missing values.

eTable 2 Contents of death visions (n=403)

ACCEPTED MANUSCRIPT

Contents	%	N
Deceased persons	100	43
Parents	77	310
Mother	44	177
Father	33	133
Siblings	28	113
Friends	19	76
Child	13	52
Spouse	9.9	40
Grandmother/grandfather	1.5	6
Other family members	5.0	20
Pets	2.0	8
Afterlife scene	38	153
Afterlife world	16	66
Presence of border	8.9	36
God/Buddha,	8.4	34
The light	5.7	23

eTable 3 Factors associated with occurrence of deathbed visions

ACCEPTED MANUSCRIPT

Variables	Odds ratio	95% confidence intervals	P
Death locations			
Hospital	1.0 (reference)		
Palliative care units	1.1	0.76-1.4	0.90
Home	1.2	0.90-1.5	0.27
Patient characteristics			
Patient age			
≤69	1.0 (reference)		
70-89	1.7	1.3-2.2	<0.001
90≤	2.8	1.8-4.5	<0.001
Patient sex (female; male as reference)	1.4	1.1-1.7	0.004
Primary tumor sites			
Lung	1.0 (reference)		
Stomach, esophagus	0.92	0.62-1.3	0.66
Colon, rectum	1.2	0.81-1.8	0.36
Liver, bile duct, pancreas	1.3	0.93-1.8	0.13
Breast	1.3	0.83-2.2	0.23
Prostate, kidney, bladder	0.95	0.58-1.5	0.82
Uterus, ovary	0.72	0.39-1.3	0.29
Head and neck, brain	0.90	0.50-1.7	0.74
Blood	1.1	0.57-1.9	0.87
Others	1.5	0.89-2.4	0.13
Income			
Low	1.0 (reference)	0.67-1.6	0.93
High	1.0		
Living area			
Rural	1.0 (reference)	0.72-1.1	0.37
Urban	0.9		
Family characteristics			
Family age			
≤49	1.0 (reference)		
50-60	0.92	0.68-1.2	0.57
60≤	0.75	0.53-1.1	0.10
Family sex			
Male	1.0 (reference)	1.0-1.7	0.022
Female	1.3		
Relationship with patients			
husband/wife	1.0 (reference)		
child	1.5	1.2-1.9	0.001
others	1.5	1.1-2.1	0.005
Stay with patients during the final week			
Less than 4 days	1.0 (reference)		
4 days or more	1.3	0.89-1.8	0.20

Education			
Low	1.0 (reference)		
High	1.0	0.82-1.3	0.85
Religion			
None	1.0 (reference)		
Buddhism	0.87	0.69-1.1	0.24
Christianity	0.82	0.36-1.9	0.63
Others	1.1	0.72-1.8	0.57
Frequency of visiting religious places			
Rarely or never	1.0 (reference)		
Often or regularly	1.6	1.2-2.0	<0.001
Belief that the soul survives the body after death			
Disagree	1.0 (reference)		
Agree	1.5	1.1-1.9	0.003

eTable 4 Association between deathbed visions and patient's good death and family's depression

	With deathbed visions (n=377)	Without deathbed visions (n=1626)	P	Adjusted P
Good death				
Total score (mean, standard deviation)	4.8 (0.9)	4.7 (0.9)	0.17	0.68
Comfort subscale (mean, standard deviation)	5.1 (1.4)	5.0 (1.4)	0.21	0.84
Depression (% , n)	20% (n=76)	17% (n=281)	0.19	0.19

## Legend for eTable4

Good death was measured using the Good Death Inventory, with a higher score indicating a higher quality of death and dying, ranging from 1-7. Depression was measured by PHQ9. P-values were adjusted by patient age, sex, primary tumor sites, patient income, living area, family age, sex, relationship to patients, periods family members stayed with the patients during the last week, education, religion, frequency of visiting a religious place, and belief that soul survive the body after death.

eTable 5 Family emotional reaction, perception, and preferred practice

ACCEPTED MANUSCRIPT

Emotional reaction and perception	Strongly agree or agree	Unsure	Disagree or strongly disagree
Emotional reaction*	% (n)		
Patients			
Seemed to be scared, or anxious	18 (74)	26 (105)	49 (197)
Seemed to be comfortable or reassured	24 (98)	41 (165)	29 (116)
Families			
scared or anxious	21 (85)	20 (79)	53 (212)
Comfortable or reassured	12 (50)	35 (140)	45 (182)
Perceptions*			
Deathbed visions were hallucinations due to medications	25 (100)	24 (98)	45 (181)
Deathbed visions were hallucinations due to impaired general conditions	36 (144)	23 (91)	35 (142)
Deathbed visions were one of natural and transpersonal phenomena in the dying process	38 (153)	26 (104)	31 (126)
Preferred practical practice**	Unnecessary	Necessary	Very necessary
Share the phenomenon neutrally, not deciding medically	18 (73)	53 (215)	24 (98)
Use psychotropics, if a patient was distressed due to deathbed visions	12 (49)	61 (244)	22 (90)
Coordinate to receive pastoral care	66 (266)	21(85)	4.5 (18)

## Legend for eTable 5

Percentages with numbers in parentheses are shown. \*: Responses of agree or strongly agree on a 5-point Likert type scale.

\*\*: Responses of necessary or strongly necessary on a 3-point Likert type scale.