Table 1 (*Continued*)

Characteristics	*n* (%)			Unadjusted OR (95% CI)	*P*-value
	Total number (*n* = 86)	Death in NH (*n* = 43)	Death in hospital (*n* = 43)		
Resident's preference for nursing home end-of-life care					
Yes	12 (14)	5 (12)	7 (16)	0.68 (0.20–2.33)	0.534
Others[f]	74 (86)	38 (88)	36 (84)	Reference	
Family decision maker preference for nursing home end-of-life care					
Yes	52 (60)	34 (79)	18 (42)	5.25 (2.02–13.60)	0.001
Others[g]	34 (40)	9 (21)	25 (58)	Reference	
Full-time physician[h]					
Presence	59 (69)	34 (79)	25 (58)	2.72 (1.05–7.05)	0.037
Absence	27 (31)	9 (21)	18 (42)	Reference	
Admission to the NH after/before LTCI					
After LTCI	19 (22)	5 (12)	14 (33)	0.27 (0.09–0.84)	0.019
Before LTCI	67 (78)	38 (88)	29 (67)	Reference	

Note: NH: nursing home, y.o. = years old, S.D.: standard deviation, OR: odds ratio, 95% CI: 95% confidence interval, LTCI: long-term care insurance.

[a] Student's *t*-test.

[b] Wilcoxon rank sum test.

[c] Fisher exact test.

[d] Main disease, presence of the disease vs. absence of the disease.

[e] Cause of death only confirmed *n* = 81 (five cases missing).

[f] Others included, preference for hospital transfer *n* = 2 (2%), no decision *n* = 2 (2%), not asked *n* = 70 (81%).

[g] Others included, preference for hospital transfer *n* = 20 (23%), leave decision to resident *n* = 1 (1%), no decision *n* = 9 (11%), no family decision maker *n* = 2 (2%), not asked *n* = 2 (2%).

[h] Full-time physician presence 1 April 1999–31 January 2002 to 1 August 2002–31 March 2003.

[20]. Other studies have reported that even if a patient has given written directions, many Japanese physicians would respect the family's wishes over those of the patient [29–32]. Qualitative studies have concluded that Japanese people regard autonomy and individual control, and the active decision-maker concept, in end-of-life care as "foreign" [33].

The presence of a full-time physician was associated with dying in a nursing home versus a hospital. A full-time physician might have better access to the medical history and laboratory results on residents, have enough time to discuss end-of-life with families and nursing home staff, and provide better information and support to nurses and aides surrounding end-of-life care, than

Table 2
Logistic regression model[a] of variables associated with death in the nursing home (*n* = 86)

Characteristics	Parameter estimate	Adjusted OR (95% CI)	*P*-value
Intercept	−10.24		
Age at death	0.08	1.08 (1.01–1.17)	0.035
Woman	−0.13	0.88 (0.20–3.81)	0.864
Unmarried	1.06	2.87 (0.61–13.49)	0.182
Living at home before nursing home	1.09	2.97 (0.87–10.19)	0.083
Bed ridden	1.03	2.80 (0.83–9.49)	0.099
Family decision makers' preference for nursing home end-of-life care	1.37	3.95 (1.21–12.84)	0.023
Full-time physician presence[b]	1.32	3.74 (1.03–13.63)	0.046
Admission to the NH after LTCI	0.08	1.09 (0.25–4.70)	0.914

Note—OR: odds ratio, 95% CI: 95% confidence interval, NH: nursing home, LTCI: long-term care insurance.

[a] Regression model included significant variables in bivariate analysis ($P < 0.1$) Hosmer–Lemshow goodness-of-statistic, $P = 0.944$.

[b] Full-time physician present 1 April 1999–31 January 2002 to 1 August 2002–31 March 2003.

part-time physicians. This result is compatible with the result of another study [24] in Japan, which found that the actual visits of physicians or their responses on the phone at night were associated with nursing home death. A qualitative study [34,35] in the United States revealed that residents and their families want to see their physician when they know that death is imminent. A quantitative study [19] in the United States also showed that nursing home residents in hospital-based facilities were less likely to die in the hospital. The presence of the physician at the bedside is important to residents and their families, and they expect and hope that their physician will visit.

Some characteristics, reported as predictors for nursing home death in previous studies, were not significantly associated with nursing home death in this study. They were low activities of daily living (ADL) [19,24,25,28], cognitive impairment [19,24], basic diseases [19,24], and cause of death [18,24,25]. The effect of LTCI, which we were the first to examine, also did not influence the site of death. The small sample size and narrow variation of our study might have caused these results.

This study was limited in several respects. It was conducted at a single nursing home in Tokyo. The sample size was small, and potential type II errors likely exist. Even among the significant variables, especially for age, 1 year had only a small impact. The data were obtained retrospectively by one researcher. Since it is very difficult for researchers to access nursing home charts in Japan, this is a limitation with possible bias. Although this study is valuable, there has been no previous chart review-based study of nursing home residents in Japan. There are some meaningful variables that a chart review cannot establish: education level, economic status, and quality of care. Not all residents and family decision-makers were asked to express a preference, and the time of asking was not standardized. In addition, it was impossible to determine precisely why the decision was made to avoid transfer to a hospital. The decision might have been due to the resident's personal preference, the document for expressing the preference, or the medical staff's interpretation of the family's preference based on the care conference. Future studies with a larger sample size should address this question, improve the power to detect the predictors, and permit a greater opportunity to generalize these results.

Nevertheless, this study is the first chart review-based study on this topic, and it included all those who died during the study period in a nursing home in Japan. We found that older age, the family decision-maker's preference for nursing home end-of-life care, and the presence of a full-time physician were associated with dying in the nursing home. In April 2006, LTCI started to reimburse each resident who opted to receive end-of-life care and died in a nursing home to promote nursing home death [36]. The goal is to encourage the provision of the elderly with a more homelike end-of-life place than hospitals, and to reduce the high medical cost of hospital death. The promotion of nursing end-of-life care without an analysis of present conditions could reduce care quality. Therefore, research on this issue is needed right now. Our findings are also intended to aid health care providers confronting the ethical dilemmas of Japanese people faced with a Western biomedical model, such as autonomy and beneficence, and to further understand nursing home end-of-life care issues.

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