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Comparison of attitudes towards five end-of-life care interventions (active pain control, withdrawal of futile life-sustaining treatment, passive euthanasia, active euthanasia and physician-assisted suicide): a multicentred cross-sectional survey of Korean patients with cancer, their family caregivers, physicians and the general Korean population

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ABSTRACT

Objectives This study determined attitudes of four groups—Korean patients with cancer, their family caregivers, physicians and the general Korean population—towards five critical end-of-life (EOL) interventions—active pain control, withdrawal of futile life-sustaining treatment (LST), passive euthanasia, active euthanasia and physician-assisted suicide.

Design and setting We enrolled 1001 patients with cancer and 1006 caregivers from 12 large hospitals in Korea, 1241 members of the general population and 928 physicians from each of the 12 hospitals and the Korean Medical Association. We analysed the associations of demographic factors, attitudes towards death and the important components of a 'good death' with critical interventions at EoL care.

Results All participant groups strongly favoured active pain control and withdrawal of futile LST but differed in attitudes towards the other four EoL interventions. Physicians (98.9%) favoured passive euthanasia more than the other three groups. Lower proportions of the four groups favoured active euthanasia or PAS. Multiple logistic regression showed that education (adjusted OR (aOR) 1.77, 95% CI 1.33 to 2.36), caregiver role (aOR 1.67, 95% CI 1.34 to 2.08) and considering death as the ending of life (aOR 1.66, 95% CI 1.05 to 1.61) were associated with preference for active pain control. Attitudes towards death, including belief in being remembered (aOR 2.03, 95% CI 1.48 to 2.79) and feeling 'life was meaningful' (aOR 2.56, 95% CI 1.58 to 4.15) were both strong correlates of withdrawal of LST with the level of monthly income (aOR 2.56, 95% CI 1.58 to 4.15). Believing 'freedom from pain' negatively predicted preference for passive euthanasia (aOR 0.69, 95% CI 0.55 to 0.85). In addition, 'not being a burden to the family' was positively related to preferences for active euthanasia (aOR 1.62, 95% CI 1.39 to 1.90) and PAS (aOR 1.61, 95% CI 1.37 to 1.89).

Strengths and limitations of this study

- This is the first survey studying attitudes of end-of-life (EoL) interventions, such as active pain control, the withdrawal of futile life-sustaining treatment, active and passive euthanasia and physician-assisted suicide, which enable researchers to explore issues related to EoL care in Korea.
- While few studies have dealt with the attitudes of individual groups, including patients with cancer, their family caregivers, physicians and the general population, this study concluded that four groups differed in their attitudes towards five EoL interventions, and those attitudes were analysed.
- Only Korean patients with caner and their family caregivers were enrolled, so our results may not be generalisable to other terminal illnesses or cultures.

Conclusion Groups differed in their attitudes towards the five EoL interventions, and those attitudes were significantly associated with various attitudes towards death.

INTRODUCTION

Advances in our ability to postpone the death of the terminally ill has led to a debate about the ethics and legality of euthanasia and physician-assisted suicide (PAS) in many European countries,[1–5] Canada,[6] the USA,[7] Israel[8] and Japan.[9] Acceptance of euthanasia has grown in both the lay and medical communities.[10 11] Euthanasia or PAS is legal only in the Netherlands, Belgium, Switzerland, Colombia, Luxembourg, Canada and five US states,[7 12–15] but is being considered in several other countries.

In 2009, the Korean Supreme Court ordered physicians to remove a ventilator from an elderly woman in a persistent vegetative state, based on her presumed wishes.[16] That led to increased awareness of the rights of terminally ill patients and to public debate on the withdrawal of futile life-sustaining treatment (LST).[17] In February 2016, the Court ruled that patients could make LST decisions, and in February 2018, that physicians would be able to withhold or withdraw LSTs such as chemotherapy, ventilator, cardiopulmonary resuscitation and haemodialysis from dying patients.[18] This will have a profound impact on Korean end-of-life (EoL) decision-making.

Studying EoL interventions such as the withdrawal of futile LST, euthanasia and PAS enables researchers to explore issues central to EoL care.[19] Many studies of attitudes towards EoL interventions for the terminally ill have focused on euthanasia and PAS.[1 12 17 20–22] To the best of our knowledge, however, few have dealt with the attitudes among individual groups, including patients with cancer, their family caregivers, physicians and the general population.[17] Country-specific factors enter into debates on the right to die, but data about the attitudes in Asia are limited and in need of rigorous study.[7 17 23–25]

This study determines attitudes towards five critical EoL interventions—active pain control, withdrawal of futile LST, passive and active euthanasia and PAS—via a survey of patients with cancer, their family caregivers, physicians and the general Korean population and identifies[26] factors associated with those attitudes.

MATERIALS AND METHODS

Design and participants

We recruited patients with cancer and family caregivers from 11 university hospitals and the National Cancer Center, physicians from the same 12 institutions and the Korean Medical Association (KMA) and representatives of the general population. All of the surveys except for those from the physicians were collected via semi-structured interviews.

Patient and public involvement

This research arose because our investigations found that robust evidence about 'modes of death' was lacking within our communities. The research objectives and study design of this study was formulated in consultation with a World Research , specialised in surveys in Korea and several medical oncologists. In addition, the involvement of a pilot study provided valuable feedback on the conduct of the study. All the participants provided the feedback throughout the study. On publication of this manuscript, the study results disseminated to our research team and participants through our newsletters.

Patients

Our study team members, who were oncologists at 12 participating hospitals, were asked to identify clinic patients aged ≥18 years who could be recruited for the study. Of the 6024 patients identified, those who were seriously ill, felt uncomfortable, or had time constraints or invasion of privacy concerns were excluded. The remaining 1001 patients (16.6% response rate) were asked to fill out questionnaires or communicate with an interviewer, to provide informed consent, and to identify their family caregiver (the relative who provided them with the most assistance).

Family caregivers

For each patient included in the study, the relatives who assisted the patient the most were regarded as the family caregivers, and they were told about the study and interviewed by a trained research assistant. All participants provided informed consent. Finally, 1006 family caregivers were given information about the study and interviewed by a trained research assistant. (Total 5017 caregivers were contacted, 1006 completed the survey and the response rate was 20.1%.)

Physicians

We recruited professors, residents and fellows from 12 large general hospitals and medical doctors from local clinics through the KMA. We sent each physician an email with the survey URL, which included an application form and instructions. The response rate was about 30%, with 928 physicians participating. Among specialties, internal medicine was the most represented (27.2%), followed by family medicine (10%) and radiology (5.9%). In the case of status, medical school professors responded at the highest rate (39.5%), followed by residents and fellows.

General population

We aimed to recruit about 1000 members of the general Korean population, aged 20–70 years, distributed over 17 major cities and local districts. At each of the 17 major cities and local districts, interviews were conducted in two strata (age and sex) based on the guidelines of the 2015 Census of Korea. In the final sample selection, we used a probability-proportional-to-size technique, which is widely recommended for identifying a national representative sample.[27] Finally, 1241 participants from the general population agreed to participate. Individuals included in the study were aged ≥20 years, agreed to participate in the survey and understood the purpose and intention of the

survey. Considering a response rate of 10%, we contacted approximately 10 000 members of the general population distributed over 17 major city and local districts. Of those, 1241 agreed to participate. Those who were aged <20 or >70 years, could not speak, understand or read Korean or were considered to be in poor physical or mental health were excluded.

Measurement

The questionnaire collected participants' (a) attitudes towards dying and death, (b) preference for mode of ending life and (c) sociodemographic variables (sex, age, education level, employment status, religion and income).

Attitudes towards dying and death

The survey, which was taken from a previous study,[28] asked about attitudes towards death as follows: 1) death is the ending of life, 2) death is painful, 3) death is the beginning of an afterlife, 4) death is a time to be charitable and 5) death is the time of being remembered. Each response was rated on a 4-point Likert scale (1, strongly agree; 2, agree; 3, disagree; 4, strongly disagree).

Important components of a 'good death'

A 'good death is a dynamic concept, influenced by cultural values, which has evolved over time.[29–33] Several studies used the same questionnaire used here[33–36] to investigate the concept among patients, family members and physicians. The respondents were asked to select the most important components of a 'good death' from the following 10 choices: 1) presence of family, 2) not being a burden to the family, 3) resolving unfinished business, 4) feeling that life was meaningful, 5) being free of pain, 6) being at peace with God, 7) getting treatment choices, 8) having finances in order, 9) being mentally aware and 10) dying at home.

Preference for end-of-life interventions

The survey asked about the preferences for five EoL interventions, which are based on those of study issues[2 16 17 37–39] and were validated in a previous study[17]: 1) withdrawal of futile LST, 2) active pain control, 3) withholding of life-sustaining measures, 4) active euthanasia and 5) PAS, scoring responses from 1 to 4 (1, strongly agree; 2, agree; 3, disagree; 4, strongly disagree). When the response to any question was 'strongly agree' or 'agree', the participant was classified as approving the intervention.

Statistical analysis

Because the physicians were recruited via an online survey, they tended to be familiar with computers and the internet and to be relatively young. To increase the generalisability of findings among physicians, we weighted physician observations according to the age and sex distribution of the Korean physician population using the annual report of KMA membership statistics.[40]

We conducted all further analyses using the weighted data. After we estimated the proportion of respondents who preferred each mode of death, we performed adjusted logistic regression analyses to evaluate the differences of preference for specific EoL care choices between patients, family caregivers, physicians and the general Korean population. We then constructed separate stepwise logistic regression models to examine the associations of 1) sociodemographic characteristics, 2) attitudes towards dying and death and 3) the important components of a good death with preferred EoL care choices. In those analyses, we identified factors significantly associated with approval of each EoL care choice. Then we constructed final multiple stepwise logistic regression models including all demographic factors, attitudes towards death and the important components of a good death that were found to be significant in previous analyses. We used this sequential modelling approach to reduce the possibility of multicollinearity and to improve the interpretability of the results. We used SAS statistical software V.9.4 (SAS Institute, Cary, North Carolina, USA) for all analyses and calculated two-sided p values.

RESULTS

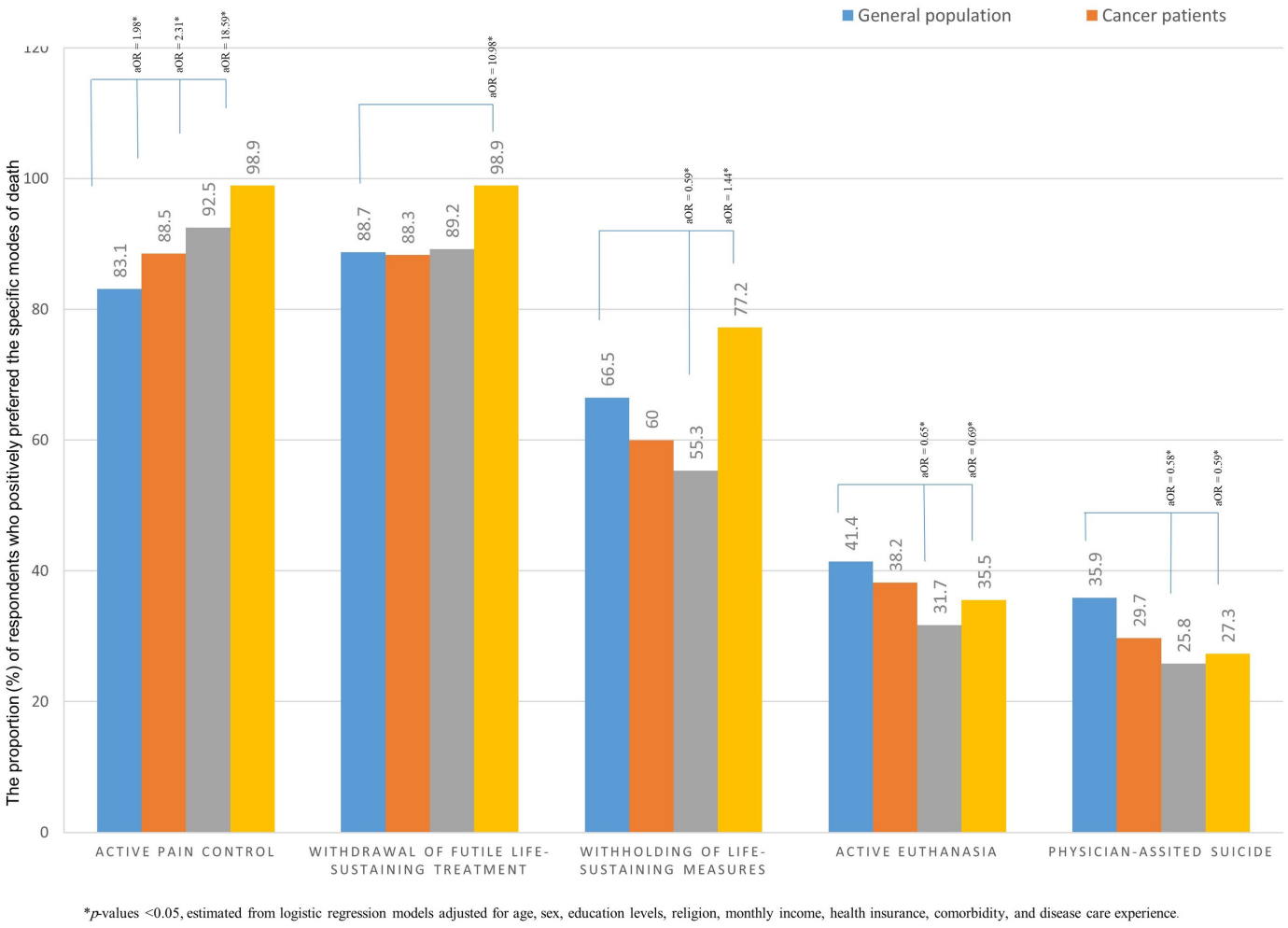
A total of 4176 participants—1001 patients with cancer, 1006 family caregivers, 928 physicians and 1241 members of the general Korean public—were included in this study. The baseline sociodemographic and clinical characteristics of the four study populations are previously described.[25]

Preference for mode of death by participant group

Figure 1 displays the proportion of respondents who answered positively for each mode of death. Overall, the four participant groups strongly agreed with active pain control and withdrawal of futile LST; 98.9% of physicians approved both, which was the highest approval rate among the groups. Physicians also exhibited the highest proportion of positive attitudes for passive euthanasia. Most of the participants in all four groups did not approve of active euthanasia or PAS. Statistically significant differences in positive responses to those two interventions were observed between the general population, family caregivers and physicians.

Associations between sociodemographic factors and preference for critical EoL interventions

Table 1 shows the univariate logistic regression analyses of sociodemographic factors associated with preferences for five EoL interventions. From each model including sociodemographic variables, significant predictors differed. Higher education, having religion and caregiver experience were associated with a positive attitude for active pain control. Higher income and caregiver experience were associated with a positive preference for withdrawal of futile LST. Participants who preferred passive euthanasia were more likely to have higher levels of education and income. Similarly, education was associated with a positive attitude towards active euthanasia, whereas



*p-values <0.05, estimated from logistic regression models adjusted for age, sex, education levels, religion, monthly income, health insurance, comorbidity, and disease care experience.

Figure 1 Proportion of respondents who preferred each mode of death by participant group. The number means the proportion (%) of respondents who preferred the specific end-of-life interventions. *P<0.05, estimated from logistic regression models adjusted for age, sex, education level, religion, monthly income, health insurance, comorbidity and caregiver experience.

having had a caregiving role was negatively associated. A higher educational level was also associated with approval of PAS, as was the absence of religion.

Associations between attitude towards death and preference for mode of death

Several attitudes towards death were associated with preferences for mode of death (table 2). Positive attitudes towards death as the ending of life and as being painful and to be feared, believing in an afterlife, and preparing to forgive were associated with approval of active pain control. Regarding death as something to be feared and being remembered after death were positively associated with withdrawal of LST.

Associations between components of a good death and preference for EoL interventions

Table 3 shows associations between components of a good death and attitudes towards five EoL care choices. Active pain control and withdrawal of futile LST were positively associated with the feeling that life was meaningful and negatively associated with presence of family. Participants who considered resolving unfinished business or freedom from pain as important components of a good death were likely to view passive euthanasia negatively. Preference for active euthanasia and PAS was positively associated with being of little burden to one's family and negatively associated with the feeling that life was meaningful.

Multiple logistic regression models for factors considered important in preference for EoL interventions

We used 16 factors—6 demographic, 5 from attitudes towards death and 5 from components of a good death—to perform stepwise multiple logistic regression analyses (table 4).

Preference for active pain control was positively associated with higher education, caregiver experience and positive attitudes for death as the ending of life and inversely associated with the presence of family as a component of a good death. Belief in being remembered after death and that 'life was meaningful' as core components of a good death, as well as monthly income, were strong correlates of approval of withdrawal of LST. The

Table 1 Associations between sociodemographic factors and preference for mode of death

	Active pain vontrol			Withdrawal of futile LST			Passive euthanasia			Active euthanasia			Physician-assisted suicide		
	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values
Sex															
Male	1840 (90.5)	193 (9.5)	N.S.	1853 (91.2)	180 (8.8)	N.S.	1375 (67.6)	658 (32.4)	0.001	769 (37.8)	1265 (62.2)	N.S.	636 (31.3)	1398 (68.7)	N.S.
Female	1923 (89.8)	219 (10.2)		1946 (90.9)	196 (9.2)		1323 (61.8)	819 (38.2)		775 (36.2)	1367 (63.8)		618 (28.9)	1524 (71.1)	
Age (years)															
<50	2046 (90.3)	220 (9.7)	N.S.	2080 (91.8)	186 (8.2)	N.S.	1512 (66.7)	755 (33.3)	N.S.	846 (37.3)	1421 (62.7)	N.S.	706 (31.2)	1560 (68.8)	N.S.
≥50	1718 (90.0)	192 (10.0)		1720 (90.1)	190 (9.9)		1187 (62.2)	723 (37.8)		699 (36.6)	1211 (63.4)		549 (28.7)	1361 (71.3)	
Education															
Middle school or less	389 (84.8)	70 (15.2)	0.001	393 (85.6)	66 (14.4)	N.S.	242 (52.7)	217 (47.3)	0.002	132 (28.8)	327 (71.2)	<0.001	116 (25.3)	343 (74.7)	0.018
High school or higher	3280 (91.0)	324 (9.0)		3305 (91.7)	299 (8.3)		2389 (66.3)	1215 (33.7)		1368 (38.0)	2236 (62.0)		1100 (30.5)	2504 (69.5)	
Religion															
No	1818 (89.1)	223 (10.9)	0.034	1846 (90.4)	195 (9.6)	N.S.	1309 (64.2)	732 (35.8)	N.S.	784 (38.4)	1257 (61.6)	N.S.	655 (32.1)	1386 (67.9)	0.003
Yes	1945 (91.2)	189 (8.8)		1953 (91.5)	181 (8.5)		1388 (65.1)	746 (34.9)		759 (35.6)	1374 (64.4)		599 (28.1)	1535 (71.9)	
Monthly income															
<3000$	943 (88.0)	129 (12.0)	N.S.	927 (86.5)	145 (13.5)	<0.001	604 (56.3)	468 (43.7)	<0.001	358 (33.4)	714 (66.6)	N.S.	293 (27.3)	779 (72.7)	N.S.
≥3000$	2787 (90.9)	280 (9.1)		2841 (92.6)	226 (7.4)		2076 (67.7)	991 (32.3)		1174 (38.3)	1893 (61.7)		950.6 (31.0)	2116 (69.0)	
Health insurance															
National Health Insurance	3615 (90.0)	400 (10.0)	N.S.	3652 (91.0)	363 (9.0)	N.S.	2611 (65.0)	1404 (35.0)	N.S.	1488 (37.0)	2527 (63.0)	N.S.	1204 (30.0)	2811 (70.0)	N.S.
Medicaid	94 (90.4)	10 (9.6)		93 (89.4)	11 (10.6)		61 (58.7)	43 (41.3)		43 (41.4)	61 (58.6)		39 (37.5)	65 (62.5)	
Comorbidity															
No	2704 (90.6)	280 (9.4)	N.S.	2748 (92.1)	236 (7.9)	N.S.	1971 (66.1)	1012 (33.9)	N.S.	1091 (36.6)	1892 (63.4)	N.S.	906 (30.4)	2078 (69.6)	N.S.
Yes	1060 (88.9)	132 (11.1)		1052 (88.3)	140 (11.8)		727 (61.0)	465 (39.0)		453 (38.0)	739 (62.0)		349 (29.2)	844 (70.8)	
Caregiver experience															
No	1853 (87.7)	260 (12.3)	<0.001	1894 (89.7)	219 (10.3)	0.007	1384 (65.5)	729 (34.5)	N.S.	820 (38.8)	1294 (61.2)	0.010	662 (31.3)	1451 (68.7)	N.S.
Yes	1911 (92.7)	152 (7.4)		1906 (92.4)	157 (7.6)		1315 (63.7)	748 (36.3)		725 (35.2)	1338 (64.9)		592 (28.7)	1471 (71.3)	

P values were estimated from models using stepwise selection.
LST, life-sustaining treatment; N.S., non-significant.

Table 2 Associations between attitude towards death and preference for mode of death

	Active pain control			Withdrawal of futile LST			Passive euthanasia			Active euthanasia			Physician-assisted suicide		
	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values
Life ends with death															
Negative	1003 (87.6)	142 (12.4)	0.001	1030 (90.0)	115 (10.0)	N.S.	707 (61.7)	438 (38.3)	N.S.	311 (27.1)	834 (72.9)	<0.001	242 (21.1)	903 (78.9)	<0.001
Positive	2761 (91.1)	270 (8.9)		2770 (91.4)	261 (8.6)		1992 (65.7)	1039 (34.3)		1234 (40.7)	1797 (59.3)		1013 (33.4)	2018 (66.6)	
Death is painful and therefore to be feared															
Negative	1645 (88.4)	215 (11.6)	0.014	1671 (89.8)	190 (10.2)	0.009	1174 (63.1)	686 (36.9)	0.016	632 (34.0)	1229 (66.0)	N.S.	500 (26.9)	1361 (73.2)	0.033
Positive	2119 (91.5)	196 (8.5)		2129 (92.0)	186 (8.0)		1524 (65.8)	791 (34.2)		913 (39.4)	1403 (60.6)		755 (32.6)	1560 (67.4)	
Life continues to remain intact after ending of life															
Negative	1743 (88.8)	220 (11.2)	0.003	1785 (90.9)	178 (9.1)	N.S.	1254 (63.9)	709 (36.1)	N.S.	710 (36.2)	1253 (63.8)	0.002	568 (28.9)	1395 (71.1)	0.002
Positive	2022 (91.3)	192 (8.7)		2015 (91.0)	198 (9.0)		1445 (65.3)	769 (34.7)		835 (37.7)	1379 (62.3)		687 (31.0)	1527 (69.0)	
Dying people should prepare to practice charity															
Negative	343 (86.3)	54 (13.7)	0.018	338 (85.1)	59 (14.9)	0.018	238 (60.0)	159 (40.0)	N.S.	137 (34.4)	261 (65.6)	N.S.	115 (28.9)	282 (71.1)	N.S.
Positive	3421 (90.6)	357 (9.5)		3462 (91.6)	317 (8.4)		2460 (65.1)	1318 (34.9)		1408 (37.3)	2371 (62.7)		1140 (30.2)	2639 (69.8)	
People should be remembered															
Negative	304 (86.6)	47 (13.4)	N.S.	293 (83.4)	58 (16.6)	0.001	171 (48.7)	180 (51.4)	<0.001	117 (33.2)	235 (66.8)	N.S.	100 (28.4)	252 (71.6)	N.S.
Positive	3460 (90.5)	364 (9.5)		3507 (91.7)	318 (8.3)		2528 (66.1)	1297 (33.9)		1428 (37.3)	2397 (62.7)		1155 (30.2)	2670 (69.8)	

P values were estimated from models using stepwise selection.
LST, life-sustaining treatment; N.S., non-significant.

Table 3 Associations between factors related to well-dying and preference for mode of death

	Active pain control			Withdrawal of futile LST			Passive euthanasia			Active euthanasia			Physician-assisted suicide		
	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values	Positive	Negative	P values
Presence of family															
Negative	2849 (90.5)	298 (9.5)	N.S.	2889 (91.8)	257 (8.2)	0.031	1996 (63.4)	1151 (36.6)	N.S.	1182 (37.6)	1965 (62.4)	N.S.	970 (30.8)	2177 (69.2)	N.S.
Positive	916 (89.0)	114 (11.1)		911 (88.5)	119 (11.5)		703 (68.3)	327 (31.7)		363 (35.2)	667 (64.8)		285 (27.7)	744 (72.3)	
Not be a burden to family															
Negative	2927 (90.2)	319 (9.8)	N.S.	2964 (91.4)	281 (8.7)	N.S.	2084 (64.2)	1161 (35.8)	N.S.	1103 (34.0)	2142 (66.0)	<0.001	888 (27.4)	2357 (72.6)	<0.001
Positive	838 (90.0)	93 (10.0)		836 (89.8)	95 (10.2)		615 (66.0)	316 (34.0)		442 (47.5)	489 (52.5)		366 (39.4)	565 (60.7)	
Resolve unfinished business															
Negative	3101 (90.2)	337 (9.8)	N.S.	3124 (90.9)	314 (9.1)	N.S.	2249 (65.4)	1190 (34.6)	0.004	1280 (37.2)	2158 (62.8)	N.S.	1038 (30.2)	2401 (69.8)	N.S.
Positive	663 (90.0)	74 (10.0)		676 (91.6)	62 (8.4)		450 (61.0)	287 (39.0)		264 (35.8)	473 (64.2)		217 (29.4)	521 (70.6)	
Feel life was meaningful															
Negative	3233 (89.8)	369 (10.2)	0.035	3248 (90.2)	354 (9.8)	<0.001	2305 (64.0)	1297 (36.0)	N.S.	1280 (38.3)	2222 (61.7)	0.004	1130 (31.4)	2472 (68.6)	0.003
Positive	532 (92.6)	43 (7.4)		552 (96.2)	22 (3.8)		394 (68.6)	180 (31.4)		165 (28.7)	409 (71.3)		124 (21.7)	450 (78.3)	
Freedom from pain															
Negative	3373 (90.0)	374 (10.0)	N.S.	3406 (90.9)	340 (9.1)	N.S.	2456 (65.6)	1290 (34.4)	<0.001	1383 (36.9)	2363 (63.1)	N.S.	1113 (29.7)	2633 (70.3)	0.032
Positive	392 (91.2)	38 (8.8)		394 (91.6)	36 (8.4)		243 (56.5)	187 (43.5)		162 (37.6)	268 (62.4)		141 (32.9)	288 (67.1)	

P values were estimated from models using stepwise selection.
LST, life-sustaining treatment; N.S., non-significant.

Table 4 Multiple logistic regression models for factors considered important in preference for mode of deaths

	Active pain control		Withdrawal of futile LST		Passive euthanasia		Active euthanasia		Physician-assisted suicide	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Sex										
Male					Ref	Ref			Ref	
Female					0.80	0.70 to 0.91			0.87	0.76 to 1.00
Age (years)										
<50										
≥50										
Education										
Middle school or less	Ref	Ref			Ref	Ref	Ref	Ref	Ref	Ref
High school or higher	1.77	1.33 to 2.36			1.43	1.14 to 1.79	1.70	1.36 to 2.12	1.40	1.12 to 1.77
Religion										
No	Ref	Ref								
Yes	1.28	1.02 to 1.59								
Monthly income										
<3000 $			Ref	Ref	Ref	Ref				
≥3000 $			1.83	1.46 to 2.30	1.38	1.17 to 1.63				
Caregiver experience										
No	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref		
Yes	1.67	1.34 to 2.08	1.38	1.11 to 1.72	0.87	0.76 to 1.00	0.86	0.75 to 0.98		
Life ends with death										
Negative	Ref	Ref					Ref	Ref	Ref	Ref
Positive	1.66	1.30 to 2.11					1.80	1.54 to 2.12	1.87	1.57 to 2.22
Death is painful and therefore to be feared										
Negative	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Positive	1.3	1.05 to 1.61	1.39	1.12 to 1.73	1.18	1.04 to 1.35	1.15	1.01 to 1.32	1.19	1.03 to 1.37
Life continues to remain intact after ending of life										
Negative	Ref	Ref					Ref	Ref	Ref	Ref
Positive	1.27	1.02 to 1.60					1.18	1.03 to 1.35	1.26	1.09 to 1.46
People should prepare to show mercy										
Negative	Ref	Ref								
Positive	1.39	1.01 to 1.93								

Continued

Table 4 Continued

	Active pain control		Withdrawal of futile LST		Passive euthanasia		Active euthanasia		Physician-assisted suicide	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
People should be remembered										
Negative			Ref	Ref	Ref	Ref				
Positive			2.03	1.48 to 2.79	1.96	1.56 to 2.46				
Presence of family										
Negative	Ref	Ref	Ref	Ref						
Positive	0.78	0.62 to 0.99	0.71	0.56 to 0.90						
Not be a burden to family										
Negative							Ref	Ref	Ref	Ref
Positive							1.62	1.39 to 1.90	1.61	1.37 to 1.89
Resolve unfinished business										
Negative					Ref	Ref				
Positive					0.82	0.69 to 0.98				
Feel life was meaningful										
Negative			Ref	Ref			Ref	Ref	Ref	Ref
Positive			2.56	1.58 to 4.15			0.73	0.60 to 0.89	0.68	0.54 to 0.85
Freedom from pain										
Negative					Ref	Ref				
Positive					0.69	0.55 to 0.85				

aOR, adjusted OR; LST, life-sustaining treatment.

attitude of being remembered after death, along with higher education, was positively associated with passive euthanasia. On the other hand, regarding 'freedom from pain' as an important factor of a good death negatively predicted a preference for passive euthanasia. Education level, three attitudes towards death (being the end of life, being feared and being remembered) and not being a burden to one's family as a component of a good death were related to positive attitudes towards both active euthanasia and PAS (table 4).

DISCUSSION

Our study is unique in its recruitment of a large number of patients with cancer, family caregivers, physicians and members of the general public. An important finding was the extensive support for active pain control and withdrawal of futile LST in terms of EoL care by most members of the participant groups and the negative attitudes towards euthanasia and PAS. These findings suggest that recent debates on withdrawal of futile LST[17 41] and its legalisation[18] may be influenced by societal preferences aligning with government policy. The findings are consistent with those of Western and other Asian studies.[9 23 42] Physicians had a more negative attitude towards the active ending of life (euthanasia and PAS) than members of the other groups. Despite the general consensus of positive attitudes towards euthanasia and PAS in some Western studies,[1 12 17 20–22] only a small percentage of participants among our four groups reported a similar attitude.

The Korean Supreme Court decision[16] and legalisation of withdrawal of futile LST by physicians[18] have a long and painful history. Physician-assisted dying (PAD) and PAS are still illegal in Korea, as well as in China and Japan,[9] although the Canadian Supreme Court legalised PAD in 2015.[6 43] The guidelines of the Consensus Committee on the withdrawal of LST designated by the Korean Minister of Health and Welfare permit withdrawal of LST from terminally ill patients according to their advance directives or will and via a review of the hospital ethics committee.[25 44] The Korean law also emphasises continuous pain control, nutritional support and administration of fluid.

In Korea, there have been public debates on passive euthanasia and withdrawal of LST issues involving current medical and legal situations.[45] Ceasing LST with the primary intention of ending the life of an unconscious patient (eg, one who is in a vegetative state) who could survive with such treatment is considered passive euthanasia and is banned. Withholding futile LST, however, while it may border on passive euthanasia, allows natural death when death is imminent even after medical treatment; it is not a life-shortening action. Thus, we distinguished between passive euthanasia and withholding futile LST in this study. Despite the euthanasia ban, however, over half of our participant groups supported withholding futile LST, suggesting the possibility that following the February 2018 Supreme Court ruling, passive euthanasia will be discussed extensively in Korea, a super-aged society.[1]

The proportion of positive attitudes in Korea towards euthanasia or PAS is relatively low compared with the Netherlands,[46] the USA[47] and Canada,[1 48] where 60%–90% of patients support these procedures.[17] As Koreans generally support only conservative EoL care choices, that is not surprising. The greater public acceptance of euthanasia in earlier studies from Western countries might follow from a rising belief in personal autonomy regarding EoL decisions and the secularisation and individualisation of society.[1] In the USA, however, public support for active euthanasia and PAS decreased from 75% in 2005 to 64% in 2012 and has also decreased in most Central and Eastern European countries.[7] Regardless of public attitudes, the new rulings might change the attitudes towards withdrawal of futile LST and be viewed as an expansion of the rights of patients. Although euthanasia or PAS is unethical and illegal in Korea, its time will come.

Several earlier studies found that demographic characteristics have little predictive power on attitudes towards EoL interventions. In the present study, women were less likely than men to prefer passive euthanasia and PAS, but sex was not associated with any significant difference in attitude towards other EoL interventions. The influence of sex was inconsistent and not a major factor.[7 17] As people age, they are faced with deteriorating health and the loss of family members and friends and thus may be expected to support withdrawal of LST, euthanasia and PAS.[17] In this survey, however, age was not associated with attitudes towards acceptance of euthanasia and PAS, and its influence in most other studies was inconsistent.[37 38 49] Our finding that participants who were more educated and affluent were more supportive of euthanasia and PAS is not consistent with findings from a 2000 US study.[38] Previous studies showed that religion was strongly associated with attitude towards PAS,[15 38 46] while the present study showed only a moderate association of religion with attitude towards active pain control. Since our study surveyed attitudes towards death and towards 'a good death', and included those attitudes in multiple logistic analyses, attitudes might have had a greater influence than religion on the results.

This study showed that attitudes towards dying and death were positively associated with various EoL interventions. It is understandable that participants 'fearing death because it is painful' are more likely to favour all five EoL interventions. Interestingly, participants 'preparing to practice charity' for a good death favour active pain control, and participants who anticipate 'being remembered' favour dignity with death and passive euthanasia more than active euthanasia and PAS. As few studies include attitudes towards dying and death in the final logistic regression results for EoL interventions, these findings need further study.

This study also showed that attitudes towards death and towards 'a good death' were associated with the mode of death. Participants choosing 'presence of family' as

a component of a good death were less likely to favour active pain control and withdrawal of futile LST. The wish to be conscious at EoL or surrounded by family would more likely be associated with a refusal of high dosages of morphine and cessation of LST.[50] Multiple regression modelling also confirmed the association of 'not to be a burden to family' with hastened death, such as active euthanasia and PAS.[51] Participants wanting to not be a burden to family at EoL were more likely to accept euthanasia and PAS. In other studies, fear of becoming dependent on the family, perceiving oneself as a financial burden to others and lacking social support were related to acceptance of a hastened death.[50 51] Interestingly, our study also found that subjects 'feeling life was meaningful' were more likely to consider withdrawal of futile LST but less likely to consider euthanasia or PAS, a finding similar to that of an earlier US study suggesting that 'feeling appreciated' was associated with being less likely to consider euthanasia or PAS.[38]

Our study confirmed that various attitudes towards death, and towards a 'good death', influence attitudes towards mode of death. These findings suggest that physicians should systematically explore those attitude of EoL patients and manage their multidimensional care needs so as to support their preference.[15]

As our study had several limitations, these findings should be cautiously interpreted. First, the response rates of the four subject groups were low, so the results may not be generalisable. Second, we enrolled only Korean patients with cancer and their family caregivers, so our results may not be generalisable to other cultures or other terminal illnesses. Most patients, however, are likely to face EoL issues such as those discussed here. In addition, we did not investigate details about whether patients were receiving active cancer treatment or palliative care. Since they were patients at oncologic clinics, they were likely to be receiving active treatment. Nevertheless, people's opinions change as they move along a disease trajectory, and particularly as they become closer to death, so this information should be included in future studies. Finally, attitudes towards EoL care interventions such as euthanasia and PAS vary with the wording of the survey questions and whether the questions are focused on law[7] or ethics,[14] so comparison of our findings with those from other studies has limitations.

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Contributors YHY participated in the design of the study, provided financial support and study materials, collected and assembled the data, interpreted the analyses and participated in the sequence alignment and drafting of the manuscript. K-NK participated in the design of the study, the statistical analyses and drafting of the manuscript. J-AS participated in the study design and coordination, data analyses and the sequence alignment and drafting of the manuscript. SHY and MSK participated in the design of the study, the statistical analyses and the drafting of the manuscript. YAK participated in the design of the study, the collection and assembly of the data and the drafting of the manuscript. BDK, HJS, E-KS, JHKa, JHKw, JLL, EMN, CHM, EJK, YRD, YSC and KHJ participated in the design of the study, the provision of study materials and patients, the collection and assembly of the data and the drafting of the manuscript. All authors read and approved the final manuscript.

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Competing interests None declared.

Patient consent Obtained.

Ethics approval The Institutional Review Boards (IRBs) at all participating institutions (Seoul National University Hospital, Seoul National University Bundang Hospital, National Cancer Center, Keimyung University Dong-san Hospital, Ewha Womans University Hospital, Chonnam National University Hospital, Chonbuk National University Hospital, Gyeongsang National University Hospital, Kangdong Sacred Heart Hospital, Daegu Fatima Hospital, Kyung Hee University Hospital, Korea University Guro Hospital, Chungnam National University Hospital, Asan Medical Center) approved the study protocol (IRB No. E-1607-107-777).

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Correction: *Comparison of attitudes towards five end-of-life care interventions (active pain control, withdrawal of futile life-sustaining treatment, passive euthanasia, active euthanasia and physician-assisted suicide): a multicentred cross-sectional survey of Korean patients with cancer, their family caregivers, physicians and the general Korean population*

Yun YH, Kim K, Sim J, *et al*. Comparison of attitudes towards five end-of-life care interventions (active pain control, withdrawal of futile life-sustaining treatment, passive euthanasia, active euthanasia and physician-assisted suicide): a multicentred cross-sectional survey of Korean patients with cancer, their family caregivers, physicians and the general Korean population. *BMJ Open* 2018;8:e020519. doi: 10.1136/bmjopen-2017–020519.

This article was previously published with below errors.

In the October 2018 edition of the *BMJ Open* (2018;8:e020519), we published an article entitled "Comparison of attitudes towards five end-of-life care interventions (active pain control, withdrawal of futile life-sustaining treatment, passive euthanasia, active euthanasia and physician-assisted suicide): a multicentred cross-sectional survey of Korean patients with cancer, their family caregivers, physicians and the general Korean population". While recently extending that research, however, we discovered that 236 members of the general population were mistakenly to be duplicated by the investigating agency (World Research) and reported 1241 were reported rather than 1005. Here, we present corrections and discuss the relevant data. Please note that the changes do not impact the overall conclusions of the article.

In the ABSTRACT, the fourth, fifth, sixth and seventh sentences of the results paragraph (page 1) should be corrected to the following:

Multiple logistic regression showed that education (adjusted OR (aOR) 1.82, 95% CI 1.35 to 2.47), religion (aOR 1.29, 95% CI 1.02 to 1.63), caregiver role (aOR 1.56, 95% CI 1.23 to 1.96) and considering death as the ending of life (aOR 1.58, 95% CI 1.22 to 2.04) were associated with preference for active pain control. Attitudes towards death, including belief in being remembered (aOR 2.00, 95% CI 1.45 to 2.77) and feeling 'life was meaningful' (aOR 2.49, 95% CI 1.51 to 4.09) were both strong correlates of withdrawal of LST with the level of monthly income (aOR 1.89, 95% CI 1.50 to 2.39). Believing 'freedom from pain' negatively predicted preference for passive euthanasia (aOR 0.67, 95% CI 0.54 to 0.84). In addition, 'not being a burden to the family' was positively related to preferences for active euthanasia (aOR 1.58, 95% CI 1.34 to 1.85) and PAS (aOR 1.70, 95% CI 1.43 to 2.01).

In the MATERIALS AND METHODS section of the paper, the last sentence of page 2 should be corrected to the following:

Finally, 1005 participants from the general population provided their consent to participate.

In the MATERIALS AND METHODS section of the paper, the second sentence of page 3 should be corrected to the following:

Of those, 1005 agreed to participate.

In the RESULTS section of the paper, the first sentence of the first paragraph (page 3) should be corrected to the following:

In total, 3940 participants—1001 patients with cancer, 1006 family caregivers, 928 physicians and 1005 members of the general Korean public—were included in this study.

Table 1 Associations between sociodemographic factors and preference for mode of death

	Active Pain Control			Withdrawal of Futile LST			Passive Euthanasia			Active Euthanasia			Physician-Assisted Suicide		
	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value
Sex															
Male	1753 (91.5)	162 (8.5)	N.S.	1748 (91.3)	167 (8.7)	N.S.	1297 (67.7)	618 (32.3)	0.004	727 (38.0)	1189 (62.1)	N.S.	598 (31.2)	1318 (68.8)	N.S.
Female	1833 (90.6)	191 (9.4)		1838 (90.8)	186 (9.2)		1240 (61.3)	784 (38.7)		724 (35.8)	1300 (64.2)		576 (28.5)	1448 (71.5)	
Age															
<50	1937 (91.3)	184 (8.7)	N.S.	1952 (92.0)	169 (8.0)	N.S.	1411 (66.5)	711 (33.5)	N.S.	787 (37.1)	1335 (62.9)	N.S.	654 (30.8)	1467 (69.2)	N.S.
≧50	1650 (90.7)	169 (9.3)		1635 (89.9)	184 (10.1)		1127 (62.0)	692 (38.0)		665 (36.6)	1154 (63.4)		521 (28.6)	1298 (71.4)	
Education															
Middle school or less	369 (85.4)	63 (14.6)	0.001	368 (85.2)	64 (14.8)	N.S.	222 (51.4)	210 (48.6)	0.002	124 (28.7)	308 (71.3)	<0.001	106 (24.5)	326 (75.5)	0.006
High school or higher	3130 (91.9)	276 (8.1)		3126 (91.8)	280 (8.2)		2254 (66.2)	1152 (33.8)		1286 (37.7)	2120 (62.3)		1034 (30.4)	2372 (69.7)	
Religion															
No	1710 (90.1)	189 (9.9)	N.S.	1722 (90.7)	177 (9.3)	N.S.	1216 (64.1)	683 (36.0)	N.S.	726 (38.3)	1173 (61.8)	N.S.	600 (31.6)	1299 (68.4)	0.022
Yes	1876 (92.0)	164 (8.0)		1864 (91.4)	176 (8.6)		1320 (64.7)	720 (35.3)		724 (35.5)	1316 (64.5)		574 (28.1)	1466 (71.9)	
Monthly income															
<3000	921 (88.8)	116 (11.2)	<0.001	895 (86.3)	142 (13.7)	<0.001	580 (55.9)	457 (44.1)	<0.001	347 (33.5)	690 (66.5)	N.S.	281 (27.1)	756 (72.9)	N.S.
≧3000	2635 (91.8)	235 (8.2)		2664 (92.8)	206 (7.2)		1940 (67.6)	930 (32.4)		1092 (38.0)	1778 (62.0)		883 (30.8)	1987 (69.3)	
Health insurance															
National Health Insurance	3438 (91.0)	341 (9.0)	N.S.	3439 (91.0)	340 (9.0)	N.S.	2450 (64.8)	1329 (35.2)	N.S.	1395 (36.9)	2384 (63.1)	N.S.	1124 (29.7)	2655 (70.3)	N.S.
Medicaid	94 (90.4)	10 (9.6)		93 (89.4)	11 (10.6)		61 (58.7)	43 (41.3)		43 (41.4)	61 (58.6)		39 (37.5)	65 (62.5)	
Comorbidity															
No	2530 (92.0)	221 (8.0)	N.S.	2538 (92.3)	213 (7.7)	N.S.	1813 (65.9)	937 (34.1)	N.S.	1000 (36.4)	1750 (63.6)	N.S.	827 (30.1)	1924 (69.9)	N.S.
Yes	1057 (88.9)	132 (11.1)		1049 (88.2)	140 (11.8)		724 (60.9)	465 (39.1)		451 (38.0)	738 (62.0)		349 (29.2)	842 (70.8)	
Caregiver experience															
No	1720 (89.0)	213 (11.0)	0.001	1731 (89.6)	202 (10.4)	0.023	1262 (65.3)	670 (34.7)	0.038	751 (38.8)	1183 (61.2)	0.009	605 (31.3)	1328 (68.7)	0.037
Yes	1867 (93.0)	140 (7.0)		1856 (92.5)	151 (7.5)		1276 (63.6)	731 (36.4)		701 (34.9)	1306 (65.1)		569 (28.4)	1438 (71.6)	

P values were estimated from models using stepwise selection
LST, Life-sustaining treatment; N.S., Non-significant.

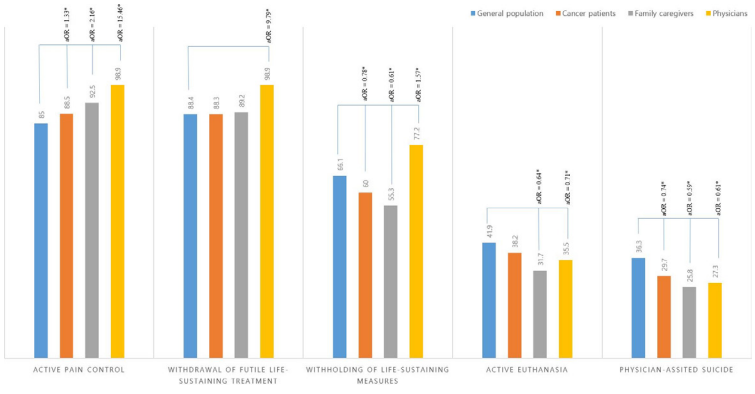

Figure 1 Proportion of respondents who preferred each mode of death by participant group. The number means the proportion (%) of respondents who preferred the specific end-of-life interventions. *P<0.05, estimated from logistic regression models adjusted for age, sex, education level, religion, monthly income, health insurance, comorbidity and caregiver experience.

Table 2 Associations between attitude toward death and preference for mode of death

	Active Pain Control			Withdrawal of Futile LST			Passive Euthanasia			Active Euthanasia			Physician-Assisted Suicide		
	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value
Life ends with death															
Negative	964 (88.9)	121 (11.1)	0.004	973 (89.7)	112 (10.3)	N.S.	660 (60.8)	425 (39.2)	N.S.	294 (27.1)	791 (72.9)	<0.001	229 (21.1)	856 (78.9)	<0.001
Positive	2623 (91.9)	232 (8.1)		2614 (91.6)	241 (8.5)		1878 (65.8)	977 (34.2)		1158 (40.6)	1697 (59.4)		946 (33.1)	1909 (66.9)	
Death is painful and therefore to be feared															
Negative	1566 (89.3)	187 (10.7)	0.009	1573 (89.7)	181 (10.3)	0.004	1107 (63.2)	646 (36.9)	0.004	589 (33.6)	1165 (66.4)	N.S.	467 (26.6)	1287 (73.4)	0.038
Positive	2021 (92.4)	165 (7.6)		2014 (92.1)	172 (7.9)		1430 (65.4)	756 (34.6)		863 (39.5)	1324 (60.5)		708 (32.4)	1478 (67.6)	
Life continues to remain intact ending of life															
Negative	1691 (89.8)	192 (10.2)	0.006	1712 (90.9)	171 (9.1)	N.S.	1207 (64.1)	676 (35.9)	N.S.	689 (36.6)	1194 (63.4)	0.022	549 (29.2)	1334 (70.8)	0.014
Positive	1897 (92.1)	161 (7.8)		1875 (91.1)	182 (8.9)		1331 (64.7)	727 (35.3)		763 (37.1)	1295 (62.9)		626 (30.4)	1432 (69.6)	
Dying people should prepare to practice charity															
Negative	333 (87.6)	47 (12.4)	0.024	323 (84.9)	57 (15.1)	0.012	227 (59.8)	153 (40.3)	N.S.	127 (33.3)	254 (66.7)	N.S.	105 (27.6)	275 (72.4)	N.S.
Positive	3254 (91.4)	305 (8.6)		3264 (91.7)	296 (8.3)		2310 (64.9)	1249 (35.1)		1325 (37.2)	2235 (62.8)		1070 (30.1)	2490 (70.0)	
People should be remembered															
Negative	298 (88.2)	40 (11.9)	N.S.	283 (83.7)	55 (16.3)	0.002	163 (48.2)	175 (51.9)	<0.001	112 (33.0)	227 (67.0)	N.S.	97 (28.6)	242 (71.4)	N.S.
Positive	3289 (91.3)	312 (8.7)		3304 (91.7)	298 (8.3)		2375 (65.9)	1227 (34.1)		1340 (37.2)	2262 (62.8)		1078 (20.0)	2524 (70.1)	

P values were estimated from models using stepwise selection.
LST, Life-sustaining treatment; N.S., Non-significant.

In the RESULTS section of the paper, the third paragraph (page 3) should be corrected to the following:

Table 1 shows the univariate logistic regression analyses of sociodemographic factors associated with preferences for five EoL interventions. From each model including sociodemographic variables, significant predictors differed. Higher education, higher income and caregiver experience were associated with a positive attitude for active pain control. Higher income and caregiver experience were associated with a positive preference for withdrawal of futile LST. Participants who preferred passive euthanasia were more likely to have higher levels of education

Table 3 Associations between factors related to well-dying and preference for mode of death

	Active Pain Control			Withdrawal of Futile LST			Passive Euthanasia			Active Euthanasia			Physician-Assisted Suicide		
	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value	Positive	Negative	P value
Presence of family															
Negative	2704 (91.4)	254 (8.6)	N.S.	2713 (91.7)	244 (8.3)	0.031	1871 (63.3)	1087 (36.7)	N.S.	1105 (37.4)	1853 (62.6)	N.S.	903 (30.5)	2055 (69.5)	N.S.
Positive	884 (89.9)	99 (10.1)		874 (88.9)	109 (11.1)		667 (67.9)	316 (32.1)		347 (35.3)	636 (64.7)		272 (27.7)	710 (72.3)	
Not be a burden to family															
Negative	2792 (91.2)	269 (8.8)	N.S.	2798 (91.4)	262 (8.6)	N.S.	1959 (64.0)	1101 (36.0)	N.S.	1041 (34.0)	2019 (66.0)	<0.001	830 (27.1)	2230 (72.9)	<0.001
Positive	796 (90.4)	84 (9.6)		789 (89.6)	91 (10.4)		579 (65.8)	301 (34.2)		411 (46.7)	469 (53.3)		344 (39.1)	536 (60.9)	
Resolve unfinished business															
Negative	2953 (91.1)	289 (8.9)	N.S.	2948 (90.9)	294 (9.1)	N.S.	2113 (65.2)	1130 (34.9)	0.005	1204 (37.1)	2038 (62.9)	N.S.	976 (30.1)	2267 (69.9)	N.S.
Positive	634 (91.0)	63 (9.0)		639 (91.5)	59 (8.5)		425 (61.0)	272 (39.0)		247 (35.5)	450 (64.6)		199 (28.5)	499 (71.5)	
Feel life was meaningful															
Negative	3092 (90.6)	321 (9.4)	0.011	3080 (90.2)	333 (9.8)	<0.001	2172 (63.6)	1241 (36.4)	N.S.	1296 (38.0)	2117 (62.0)	0.019	1058 (31.0)	2355 (69.0)	0.0015
Positive	496 (94.0)	32 (6.0)		507 (96.2)	20 (3.8)		366 (69.4)	161 (30.6)		156 (29.6)	371 (70.4)		116 (22.1)	411 (77.9)	
Freedom from pain															
Negative	3215 (90.9)	322 (9.1)	N.S.	3217 (91.0)	319 (9.0)	N.S.	2316 (65.5)	1220 (34.5)	<0.001	1302 (36.8)	2234 (63.2)	N.S.	1042 (29.5)	2494 (70.5)	0.025
Positive	373 (92.4)	31 (7.6)		370 (91.6)	34 (8.4)		222 (54.9)	182 (45.1)		150 (37.1)	254 (62.9)		132 (32.8)	271 (67.2)	

P values were estimated from models using stepwise selection.
LST, Life-sustaining treatment; N.S., Non-significant.

Table 4 Multiple logistic regression models for factors considered important in preference for mode of deaths

	Active Pain Control		Withdrawal of Futile LST		Passive Euthanasia		Active Euthanasia		Physician-Assisted Suicide	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Sex										
Male					Ref	Ref			Ref	
Female					0.78	0.68 to 0.89			0.85	0.74 to 0.98
Age										
<50										
≧50										
Education										
Middle school or less	Ref	Ref			Ref	Ref	Ref	Ref	Ref	Ref
High school or higher	1.82	1.35 to 2.47			1.46	1.16 to 1.84	1.70	1.36 to 2.14	1.47	1.16 to 1.87
Religion										
No	Ref	Ref								
Yes	1.29	1.02 to 1.63								
Monthly income										
<3000			Ref	Ref	Ref	Ref				
≧3000			1.89	1.50 to 2.39	1.37	1.16 to 1.62				
Caregiver experience										
No	Ref	Ref	Ref	Ref			Ref	Ref		
Yes	1.56	1.23 to 1.96	1.39	1.10 to 1.75			0.86	0.75 to 0.98		
Life ends with death										
Negative	Ref	Ref			Ref	Ref	Ref	Ref	Ref	Ref
Positive	1.58	1.22 to 2.04			1.25	1.07 to 1.45	1.70	1.44 to 1.99	1.82	1.52 to 2.17
Death is painful and therefore to be feared										
Negative	Ref	Ref	Ref	Ref			Ref	Ref	Ref	Ref
Positive	1.34	1.06 to 1.69	1.43	1.14 to 1.79			1.18	1.02 to 1.35	1.17	1.00 to 1.35
Life continues to remain intact ending of life										
Negative	Ref	Ref							Ref	Ref
Positive	1.30	1.02 to 1.66							1.21	1.04 to 1.40
People should prepare to show mercy										
Negative	Ref	Ref								
Positive	1.39	1.01 to 1.93								
People should be remembered										
Negative			Ref	Ref	Ref	Ref				
Positive			2.00	1.45 to 2.77	1.97	1.56 to 2.48				
Presence of family										
Negative			Ref	Ref						
Positive			0.76	0.59 to 0.97						
Not be a burden to family										
Negative							Ref	Ref	Ref	Ref
Positive							1.58	1.34 to 1.85	1.70	1.43 to 2.01
Resolve unfinished business										
Negative					Ref	Ref				
Positive					0.83	0.70 to 0.99				
Feel life was meaningful										
Negative	Ref	Ref	Ref	Ref			Ref	Ref	Ref	Ref
Positive	1.58	1.07 to 2.33	2.49	1.51 to 4.09			0.76	0.62 to 0.94	0.73	0.58 to 0.92
Freedom from pain										
Negative					Ref	Ref			Ref	Ref
Positive					0.67	0.54 to 0.84			1.28	1.01 to 1.62

aOR, adjusted OR; LST, Life-sustaining treatment.

and income, whereas having had a caregiving role was negatively associated with preference for passive euthanasia. Similarly, education was associated with a positive attitude towards active euthanasia, whereas having had a caregiving role was negatively associated. A higher educational level was also associated with approval of PAS, as was the absence of religion and no caregiver experience.

Our original figure 1 (page 4), should be corrected to the following:

In the RESULTS section of the paper, the first sentence of the last paragraph (page 4) should be corrected to the following:

Preference for active pain control was positively associated with higher education, caregiver experience and positive attitudes towards death as the ending of life; furthermore, it was associated with feeling 'life was meaningful' as a component of a good death.

Our original table 1 (page 5), should be corrected to the following:

Our original table 2 (page 6), should be corrected to the following:

Our original table 3 (page 7), should be corrected to the following:

Our original table 4 (page 8), should be corrected to the following:

In the RESULTS section of the paper, the fourth and fifth sentences of the last paragraph (page 10) should be corrected to the following:

On the other hand, regarding 'freedom from pain' as an important factor of a good death negatively predicted a preference for passive euthanasia and PAS. Education level, two attitudes towards death (being the end of life and being feared) and not being a burden to one's family as a component of a good death were related to positive attitudes towards both active euthanasia and PAS (table 4).

In the discussion section, the second sentence of the sixth paragraph (page 10) should be corrected to the following:

It is understandable that participants 'fearing death because it is painful' are more likely to favour four EoL interventions.

In the discussion section, the seventh paragraph (page 11–12) should be corrected to the following:

This study also showed that attitudes towards death and towards 'a good death' were associated with the mode of death. Participants choosing 'presence of family' as a component of a good death were less likely to favour withdrawal of futile LST. Multiple regression modelling also confirmed the association of 'not to be a burden to family' with hastened death, such as active euthanasia and PAS. 50,51 Participants wanting to not be a burden to family at EoL were more likely to accept euthanasia and PAS. In other studies, fear of becoming dependent on the family, perceiving oneself as a financial burden to others and lacking social support were related to acceptance of a hastened death.50 51 Interestingly, our study also found that subjects 'feeling life was meaningful' were more likely to consider active pain control and withdrawal of futile LST but less likely to consider euthanasia or PAS, a finding similar to that of an earlier US study suggesting that 'feeling appreciated' was associated with being less likely to consider euthanasia or PAS.38

We wish to apologise to the publisher and readers of *BMJ Open* for these errors.

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