

## Has there been a change in the end-of-life decision-making over the past sixteen years?

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## **ABSTRACT**

**Objectives:** Physicians' decision-making in end-of-life care includes many medical, ethical and juridical aspects. We studied the changes of these decisions over time and factors influencing them.

**Methods:** A postal survey including two hypothetical patient scenarios were sent to 1258 Finnish physicians in 2015 and to 1182 in 1999. The attitudes, values and background factors of the physicians were also enquired.

**Results:** The response rate was 56%. The physicians' decisions to choose palliative approaches over active or intensive care increased from 1999 to 2015 when a terminally ill prostate cancer patient had probable iatrogenic GI-bleeding (53% vs 59%,  $p=0.014$ ) and waited to meet his son (46% vs 60%,  $p<0.001$ ) or a minister (53 vs 71%,  $p<0.001$ ). Training in end-of-life care independently increased palliative approaches. Patient's benefit (96% vs 99%,  $p=0.001$ ), ethical values (83% vs 93%,  $p<0.001$ ) and patient's (68 vs 86%,  $p<0.001$ ) or physician's (44% vs 63%,  $p<0.001$ ) legal protection were considered more influential to the decisions in 2015, while the family's benefit was regarded as less influential to the decisions than it was in 1999 (37% vs 25%,  $p<0.001$ ). Physicians were more willing to give a hospice voucher for an advanced breast cancer patient in 2015 (34% vs 58%,  $p<0.001$ ).

**Conclusions:** Our findings may reflect the transition to a stronger emphasis on patient-centred care and a stronger tendency to avoid futile therapies that have only short-term goals.

The results highlight that education in all aspects of end-of-life care should be incorporated into the post-graduate training of medical specialties that take care of dying patients.

## INTRODUCTION

Individualism has been rising in western countries.[1, 2] This can also be seen in medicine, where shared decision-making and patient-centred care are now preferred by most physicians and patients.[3-5] However, concerns have been raised about the excessive autonomy of patients, which can result in costly, ineffective and even futile treatments.[6] The right of the patient to be involved in treatment decisions was included in Finnish law in 1992.[7] However, the Finnish National Supervisory Authority for Welfare and Health has stated that ineffective or futile therapies should not be used even though the patient requests them.[8] Physicians have to strike a balance between the wishes of the patient and family, legal and ethical aspects and evaluate the benefit, harm and cost of the care. This makes decision-making very challenging.

Decision-making in end-of-life (EOL) care involves many ethical, legal, medical and psychological aspects, and physicians' background characteristics, specialties, attitudes and values play a part in this complex process.[9-15] The specialty of a physician impacts their decision-making, as oncologists have been shown to be more opposed to accepting the risk of hastening death by using high doses of drugs for symptom control compared to other specialties, but they are more willing to withhold or withdraw futile treatments in EOL-care.[12, 16, 17] Religion is shown to be associated with the unwillingness to withdraw life-supportive care,[16, 18, 19] whereas age and gender of the physician are inconsistent factors in the decision-making.[11, 17, 19-21]

Decision-making should be consistent in the same types of clinical situations regardless of the physician who is responsible for the care of the patient. The surrounding society and atmosphere do change over time, which might also influence the medical decisions. As the values and attitudes of the physician have a great impact on the decision-making, it is important to know whether these have changed over the years and how the possible changes affect the decisions that physicians make regarding EOL-care. A better understanding of the background factors and changes in decision-making will help to define important educational aspects of decision-making in EOL-care and will help to produce practical guidelines to provide

high-quality and equal care to all patients.

The aim of this study was to identify whether, physicians' decision-making has changed over the past sixteen years and to explore the factors influencing and explaining these decisions.

## **METHODS**

### **Participants**

A postal survey with a similar questionnaire was conducted in 1999 and 2015 with Finnish physicians. In both years, the sample included 500 general practitioners (GPs), 300 surgeons, and 300 internists who were randomly selected from the register of the Finnish Medical Association, together with all Finnish oncologists (n=82 in 1999 and n=158 in 2015). Non-responders were reminded twice. A cover letter including an introduction to the study, an assurance of anonymity and a statement of voluntariness was mailed together with the questionnaire. This study was approved by the Regional Ethics Committee of Tampere University Hospital, Finland (R15101).

### **Questionnaire**

Seven hypothetical patient scenarios were presented in the questionnaire. Following the patient scenarios, attitudes regarding several moral and ethical aspects were assessed with a 100-mm visual analogue scale (VAS) from "definitely agree" (0 mm) to "definitely disagree" (100 mm). These included, for example, statements concerning euthanasia, palliative care, the role of religion in ethical decisions, advanced directives and health care economics, together with physicians' satisfaction with their own health, work and salary. There were also questions concerning the responders' background and personal features. Changes in these attitudes have been reported earlier.[22] The questionnaire has been previously used and validated with Finnish physicians.[10, 11]

## Patient scenarios

We included two patient scenarios in this study:

Scenario 1 presented an 82-year-old retired forest worker, who had received a diagnosis of prostatic cancer 3 years ago. During the past year he received treatments for bone metastases. He has now been in hospital for one month, almost totally bedridden, and needs help with all functions. His mental condition has been normal. His general condition has weakened over the past week, he is now totally bedridden, and he has received large doses of pain medication. Today, he has become comatose. His haemoglobin count has decreased to 68 g/l, while the week before it was 118 g/l. His blood pressure is 80/40 mmHg. There is no verbal or written advance directive. The patient's wife has previously said that she expects the doctor to make all treatment decisions according to his/her best understanding. After the scenario, the doctors were asked to choose one of the given treatment options. The concepts used in the treatment options were explained as follows: 1) palliative care: good nursing, sufficient medications for pain and other symptoms, intravenous hydration only when it is considered to relieve the patient's symptoms; 2) active care: use of antibiotics, intravenous hydration or blood transfusions aimed at saving the patient's life in a life-threatening condition; 3) intensive care: moving the patient to an intensive care unit (ICU). After the initial question for scenario 1, four additional alternatives were presented, each ending with the same treatment options: a) It has been discovered that the patient's faeces are black. You remember having prescribed ketoprofen for pain a week ago; b) The patient's son is coming from America the day after tomorrow to see his father while he is still alive; c) The patient has had spiritual anxiety and there is a planned appointment with a minister and the Lord's Supper tomorrow; d) The patient's written advance directive has been found, in which the patient has expressed that all active interventions should be withheld if there is no hope for recovery. After asking for the treatment decisions, a Likert-type scale was presented to evaluate the influence of different factors (patient's benefit, family's benefit, patient's legal protection, physician's legal protection, ethical values, patient's age, cost of care, patient's social status) on the

decisions (from 1—very little influence to 5—very much influence).

In scenario 2, a 68-year-old patient suffers from breast cancer with bone metastases. She is bedridden and her general condition has rapidly collapsed. She is in a community hospital ward and is receiving adequate pain treatment with which she is pleased. She is depressed and wants to transfer to a hospice for her last days. She feels that the atmosphere on the ward is very restless and “institutional”. You have the right to issue a voucher for the costs of hospice care (290 euros per day) to be paid by the community hospital. The costs would be approximately double compared to those in a community hospital, and the chief doctor has advised you to use great discretion in issuing vouchers. Your solution: a) to accept the transfer b) to accept the transfer, provided that the patient pays the extra costs herself c) not to accept, because according to normal practice the patient’s care belongs to the community hospital ward, and there are no special problems in her care d) I don’t know e) other solution.

Responders were instructed at the outset to answer the questions in sequence from beginning to the end and not to change their answers later.

### **Statistical analysis**

In the patient scenarios, the answers were converted into two options. In patient scenario 1: choosing palliative care (response a) or choosing active and intensive care (responses b and c). In patient scenario 2: willing to give a voucher for hospice (response a) or not willing to give a voucher (other responses). The answers on the 4-point Likert scale concerning values were converted to the following 2-point scale: 1-2 for “not important” and 3-4 for “important”, and the answers on the 5-point Likert scale concerning the influence of different factors were converted to the following 2-point scale: 1-3 for “not much influence” and 4-5 for “much influence”.

The two-scale patient scenarios, background factors and values were tested using the Pearson chi-square

test. Two-sided p-values that were less than 0.05 were considered to be statistically significant.

The models explaining the decision to choose palliative care in patient scenario 1 and willingness to give a voucher for hospice in patient scenario 2 were created using forward stepwise logistic regression. Models were created from the scenarios that had a statistically significant difference between the study years. Background factors, life values, and attitudes were all included in the model.[22] The p-value for significance was set at 0.10 to enter and 0.15 to remove from the model.

The data analysis was performed using IBM SPSS Statistics for Windows, Version 23.0 (Armonk, NY: IBM Corp. Released 2014).

## **RESULTS**

### **Responders**

The characteristics of the responders are presented in Table 1. Altogether 1373 valid responses were obtained. In 1999, the responders were younger ( $p < 0.001$ ), had shorter working experience ( $p < 0.001$ ) and were more often men ( $p < 0.001$ ) compared to the responders in 2015. Oncologists reported having participated in post-graduate end-of-life training significantly more often ( $p < 0.001$ ) than other physicians (58% vs 22%).

Table 1. Characteristics of the participants.

	<i>Surgeons</i>		<i>Internists</i>		<i>GPs</i>		<i>Oncologists</i>		<i>Total</i>	
	<i>1999</i>	<i>2015</i>	<i>1999</i>	<i>2015</i>	<i>1999</i>	<i>2015</i>	<i>1999</i>	<i>2015</i>	<i>1999</i>	<i>2015</i>
Number (% of total)	175 (24)	142 (22)	184 (25)	153 (24)	316 (43)	245 (38)	54 (7)	104 (16)	<b>729 (100)</b>	<b>644 (100)</b>
Response rate, %	58	47	61	47	63	49	51	66	<b>62</b>	<b>51</b>
Female, n (%)	33 (19)	47 (33)	60 (33)	81 (53)	170 (55)	173 (71)	30 (56)	85 (82)	<b>293 (41)</b>	<b>386 (60)</b>
Mean age (range)	48 (33-66)	51 (33-64)	48 (32-70)	52 (33-65)	42 (25-63)	47 (25-65)	46 (35-61)	48 (32-67)	<b>45 (25-70)</b>	<b>50 (25-67)</b>
Working place*										
Outpatient unit	1 (1)	2 (1)	15 (9)	15 (10)	242 (78)	208 (86)	2 (4)	4 (4)	<b>260 (37)</b>	<b>229 (36)</b>
Hospital	146 (85)	124 (88)	123 (71)	122 (82)	33 (11)	24 (10)	44 (83)	91 (88)	<b>346 (49)</b>	<b>361 (57)</b>
Other	24 (14)	15 (11)	35 (20)	12 (8)	35 (11)	10 (4)	7 (13)	8 (8)	<b>101 (14)</b>	<b>45 (7)</b>
Years from graduation, median (range)**	22 (2-42)	26 (7-42)	21 (7-41)	26 (8-42)	16 (1-35)	21 (0-40)	18 (9-34)	22 (7-40)	<b>19 (1-42)</b>	<b>23 (0-42)</b>
Married, n (%)	140 (81)	119 (84)	142 (79)	124 (81)	228 (73)	198 (81)	45 (83)	71 (71)	<b>555 (77)</b>	<b>512 (80)</b>

\* For 32 participants working place was not available

\*\*For 19 participants year of graduation was not available

GP, general practitioner



## **Change in decision-making**

The overall changes in decision-making in the different patient scenarios according to physician group are shown in Table 2. Statistically significant changes towards the palliative care approach were found when the terminally ill prostate cancer patient had probable iatrogenic GI-bleeding (scenario 1a), his son was coming to see him in two days (scenario 1b) and he had a Lord's Supper with a minister planned for the next day (scenario 1c). The oncologists' approach remained unchanged during the years studied. When an advance directive was found, most physicians (86% to 94%) consistently chose a palliative care approach in both of the years studied. All of the physicians' groups were more willing to give a voucher for hospice to the patient with advanced breast cancer in 2015 than in 1999.

Table 2. Numbers and proportions of physicians choosing a palliative care approach over active/intensive care for the terminally ill patient with a prostate cancer (scenario 1) and willing to give a voucher for hospice for the advanced breast cancer patient (scenario 2).

	<i>Surgeons</i>			<i>Internists</i>			<i>GPs</i>			<i>Oncologists</i>			<i>Total</i>		
	<i>1999</i>	<i>2015</i>	<i>p</i>	<i>1999</i>	<i>2015</i>	<i>p-</i>	<i>1999</i>	<i>2015</i>	<i>p-</i>	<i>1999</i>	<i>2015</i>	<i>p-</i>	<i>1999</i>	<i>2015</i>	<i>p-</i>
<i>Number (%)</i>			<i>-value*</i>			<i>value*</i>			<i>value*</i>			<i>value*</i>			<i>value*</i>
<b>Scenario 1</b>	145 (84)	118 (84)	0.381	145 (80)	124 (82)	0.642	263 (84)	198 (82)	0.712	48 (89)	87 (84)	0.376	<b>601 (83)</b>	<b>527 (83)</b>	<b>0.712</b>
<b>Scenario 1a</b>	97 (56)	76 (55)	0.860	86 (47)	86 (57)	0.067	160 (51)	145 (60)	0.024	38 (70)	67 (64)	0.453	<b>381 (53)</b>	<b>374 (59)</b>	<b>0.014</b>
<b>Scenario 1b</b>	81 (47)	84 (61)	0.015	78 (43)	87 (57)	0.010	139 (44)	145 (60)	<0.001	31 (57)	64 (62)	0.565	<b>330 (46)</b>	<b>380 (60)</b>	<b>&lt;0.001</b>
<b>Scenario 1c</b>	91 (52)	95 (67)	0.007	97 (53)	105 (69)	0.003	161 (51)	171 (71)	<0.001	34 (64)	79 (76)	0.119	<b>384 (53)</b>	<b>450 (71)</b>	<b>&lt;0.001</b>
<b>Scenario 1d</b>	149 (86)	127 (90)	0.234	156 (86)	134 (89)	0.486	291 (92)	227 (93)	0.674	48 (89)	98 (94)	0.229	<b>644 (89)</b>	<b>586 (92)</b>	<b>0.078</b>
<b>Scenario 2</b>	61 (35)	89 (63)	<0.001	61 (33)	102 (67)	<0.001	99 (31)	121 (50)	<0.001	23 (43)	59 (57)	0.092	<b>244 (34)</b>	<b>371 (58)</b>	<b>&lt;0.001</b>

\* Pearson Chi-square test

Scenario 1: Prostate cancer patient (original scenario)

Scenario 1a: Prostate cancer patient with black feaces after ketoprophen prescription

Scenario 1b: Prostate cancer patient waiting to meet his son the day after tomorrow

Scenario 1c: Prostate cancer patient waiting to meet a minister tomorrow

Scenario 1d: Prostate cancer patient with the advance directive

Scenario 2: Breast cancer patient

## Physicians' opinions on the factors influencing their decisions

Physicians' opinions on the factors influencing their decisions concerning the terminally ill prostate cancer patient are summarized in Table 3. Patient's benefit, ethical values and patient's or physician's legal protection were more influential on the physicians' decision-making in 2015, while influence of family's benefit and patient's age decreased.

Table 3. Factors reported by the physicians to have influenced to their decisions concerning the care of the terminally ill prostate cancer patient.

	1999	2015	<i>p-value*</i>
<i>Having much influence</i>			
Patient's benefit	700 (96%)	628 (99%)	0.001
Family's benefit	265 (37%)	166 (25%)	<0.001
Patient's legal protection	493 (68%)	545 (86%)	<0.001
Physician's legal protection	319 (44%)	401 (63%)	<0.001
Ethical values	599 (83%)	638 (93%)	<0.001
Patient's age	335 (46%)	255 (40%)	0.023
Costs of care	68 (9%)	61 (10%)	0.861
Patient's social status	13 (2%)	5 (1%)	0.106

\* Pearson Chi-square test

## **Factors associated with physicians' decisions**

The results from the logistic regression analysis of the decisions concerning the terminally ill prostate cancer patient with probable iatrogenic GI-bleeding and who was waiting to meet his son or a minister (scenarios 1a-c) are presented in Table 4. The year of the survey remained a significant independent factor explaining the physicians' decision in every scenario. In general, the physicians answering in 2015 were less eager to choose active or intensive care. The willingness to withdraw life-sustaining treatments and having post-graduate EOL training were also significantly associated with a decreased likelihood of choosing active and intensive care in these scenarios. In addition, men more often chose a palliative care approach for the terminally ill prostate cancer patient when GI-bleeding was detected and when his son was coming.

Table 4. Different background factors and attitudes explaining the decision to choose active/intensive care (n=482) over a palliative care approach (n=610) concerning the prostate cancer patient with probably iatrogenic GI-bleeding and when he is waiting to meet his son or a minister (scenarios 1a-c) in forward logistic regression analysis.

	Scenario 1a				Scenario 1b				Scenario 1c			
	n	OR	(95% CI)	p-value	n	OR	(95% CI)	p-value	n	OR	(95% CI)	p-value
Year of the survey				0.006				<0.001				<0.001
1999	578	ref.			579	ref.			580	ref.		
2015	514	0.65	(0.48, 0.88)		515	0.41	(0.30, 0.56)		515	0.47	(0.36, 0.63)	
Withdrawal of life-sustaining treatments is reprehensible (VAS <sup>a</sup> )	1092	0.92	(0.87, 0.97)	0.001	1094	0.94	(0.90, 0.99)	0.028	1095	0.91	(0.86, 0.96)	0.001
People should pay costs of factitious diseases by themselves (VAS <sup>a</sup> )	1092	0.96	(0.91, 1.00)	0.071								
Advance directives have been helpful in my decisions (VAS <sup>a</sup> )					1094	0.95	(0.90, 0.99)	0.028	1095	0.95	(0.90, 0.99)	0.029
I'm pleased with my salary (VAS <sup>a</sup> )					1094	0.96	(0.92, 1.00)	0.049				
Religion has influence when I make ethical decisions (VAS <sup>a</sup> )									1095	0.93	(0.89, 0.97)	<0.001
It is waste of resources to treat patients over 80 years of age in intensive care units (VAS <sup>a</sup> )	1092	1.07	(1.02, 1.13)	0.009					1095	1.05	(1.00, 1.11)	0.065
Gender				0.005				0.001				
Female	537	ref.			539	ref.						
Male	555	0.67	(0.51, 0.88)		555	0.65	(0.50, 0.84)					
Marital status												0.055
Single									68	ref.		

Common-law marriage									98	0.82	(0.43, 1.57)	0.554
Married									841	0.63	(0.37, 1.06)	0.080
Divorced									76	1.16	(0.58, 2.32)	0.667
Widowed									12	0.92	(0.26, 3.31)	0.899
Time from graduation (years)	1092	0.99	(0.97, 1.00)	0.058					1095	0.99	(0.97, 1.00)	0.047
Amount of administrative work (hours)	1092	0.98	(0.97, 1.00)	0.055	1094	0.98	(0.97, 1.00)	0.024				
Taking care of a family member in end-of-life				0.006								
No	422	ref.										
Yes	670	0.69	(0.52, 0.90)									
Post-graduate end-of-life training				<0.001				<0.001				0.011
No	808	ref.			809	ref.			810	ref.		
Yes	284	0.54	(0.39, 0.73)		285	0.60	(0.45, 0.80)		285	0.68	(0.51, 0.92)	
Length of Life				0.089								
Important	799	ref.										
Not important	293	0.77	(0.57, 1.04)									
Physician groups				0.093								
Oncologists	121	ref.										
Surgeons	251	1.44	(0.85, 2.42)	0.173								
Internists	270	1.84	(1.11, 3.04)	0.018								
GPs	450	1.35	(0.85, 2.13)	0.206								

<sup>a</sup> VAS, visual analogue scale (0 definitely agree, 10 definitely disagree). One unit is equivalent to 10 mm on a 100-mm VAS.

GP, General Practitioner

ref., reference

Table 5 shows the results from the logistic regression analysis for the factors associated with the willingness to give a hospice voucher to the breast cancer patient with advanced disease (scenario 2). In the analysis, the responders in 2015 were more willing to give a voucher than the responders in 1999.

Table 5. Different background factors and attitudes explaining the willingness to give a voucher for hospice (n=488) versus not (n=610) for the patient with advanced breast cancer (scenario 2) in forward logistic regression analysis.

	n	OR	(95% CI)	p-value
Year of the survey				<0.001
1999	582	ref.		
2015	516	2.62	(1.96, 3.50)	
Withdrawal of life-sustaining treatments is reprehensible (VAS <sup>a</sup> )	1098	1.06	(1.00, 1.12)	0.051
People should pay costs of factitious diseases by themselves (VAS <sup>a</sup> )	1098	1.07	(1.02, 1.13)	0.004
Physicians can't estimate cancer pain (VAS <sup>a</sup> )	1098	0.93	(0.89, 0.98)	0.006
My health is excellent (VAS <sup>a</sup> )	1098	1.10	(1.04, 1.18)	0.003
It is waste of resources to treat patients over 80 years of age in intensive care units (VAS <sup>a</sup> )	1098	1.07	(1.01, 1.12)	0.017
Gender				0.084
Female	541	ref.		
Male	557	0.78	(0.59, 1.03)	
Age (years)	1098	0.98	(0.96, 0.99)	0.003
Post-graduate end-of-life training				0.089
No	811	ref.		
Yes	287	0.76	(0.56, 1.04)	
Physician groups				0.007
Oncologists	121	ref.		
Surgeons	254	0.92	(0.55, 1.54)	0.760
Internists	271	0.93	(0.57, 1.52)	0.761

GPs

452

0.58 (0.37, 0.91)

0.018

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<sup>a</sup>VAS, visual analogue scale (0 definitely agree, 10 definitely disagree). One unit is equivalent to 10 mm on a 100-mm VAS.

GP, General Practitioner

ref., reference

## DISCUSSION

Physicians in 2015 chose a palliative care approach more often than those in 1999 for the terminally ill prostate cancer patient when he had probable iatrogenic GI-bleeding and when he was waiting to meet his son or a minister in the next few days. The physicians thought that their decision-making was more influenced by patient's benefit, ethical values and patient's or physician's legal protection and less by family's benefit and patient's age than did the physicians in 1999. They were also more willing to give a voucher for hospice when the patient with advanced breast cancer wished for it during her EOL-care.

Palliative care as defined by the World Health Organization (WHO) aims to improve the quality of life of patients and their families when facing life-threatening illness, it neither hastens nor postpones death.[23] In our study, most of the physicians chose a palliative care approach for the prostate cancer patient in the EOL-care situation when no additional ethical complexities were present. This basic decision-making did not change between the years studied, showing the general medical acceptability of palliative care in this hypothetical case scenario. Further, after finding the patient's advance directive stating that active treatments should be withheld if there is no hope for recovery, almost all physicians chose a palliative care approach, without difference between the years examined. This is well in line with earlier studies showing that advance directives help decision-making in EOL-care, although physicians are concerned whether advance directives genuinely express a patient's own will.[24, 25]

When two short-term goals (meeting the son or a minister in the next few days) and a suspicion of



iatrogenic bleeding were presented, the proportion of the physicians choosing a palliative care approach decreased, but significantly less in 2015 than in 1999. These scenarios forced the responding physicians to make ethically demanding decisions. One can argue that life-sustaining interventions might be ethically justified as a part of the palliative care to achieve these patient-centred short-term goals. On the other hand, more aggressive life-prolonging interventions in this case scenario might lead to overwhelming and prolonged suffering, together with the substantial costs of futile treatments.

In 2015, physicians were less influenced by family's benefit, which probably reflects to their unwillingness to choose active and intensive care when the son of the terminally ill prostate cancer patient was coming. The lower influence of the family's benefit may be due to rising individualism in western countries.[1, 2] Religion has earlier been shown to have tremendous effect on end-of-life decisions.[16, 18, 19, 21, 26] We have previously shown that physicians had less faith in God and considered religion to be less influential in ethical decisions in 2015 than they did previously.[22] Thus, it is not surprising that an appointment with a minister shifted the treatment decisions to life-prolonging modalities less often in 2015 than in 1999. Guilt has been shown to be one of the reasons why futile treatments are carried on in EOL-care.[27] This could explain, at least to some extent, why approximately half of the physicians chose an active approach upon discovery of GI-bleeding that was likely caused by the previously prescribed ketoprofen, although this shift to life-sustaining treatment was slightly less common in 2015. Nevertheless, the principal justification for every treatment should be the patient's benefit, not the physician's attitudes and feelings in everyday decision-making. One of the reasons for the increased tendency to choose a palliative care approach in 2015 might be a better understanding of palliative care, which leads to the avoidance of futile therapies in EOL-care even in ethically complex situations. This assumption was further supported by the analysis of background factors for decision-making, which revealed an association between training in EOL-care and choosing a palliative care approach.

Using logistic regression analysis, we also investigated whether the changes between the years were genuine. It appeared that the significant differences in decision-making still remained after taking into

account confounding factors. In addition, some other important factors that influenced to the decisions were discovered, including the constant effect of post-graduate end-of-life training. As a whole, physicians who considered the withdrawal of life-sustaining treatments to be less reprehensible chose a palliative care approach more often in all scenarios. This is understandable when taking into account the nature of palliative care, in which considering the withdrawal of life-sustaining treatments to be reprehensible could be problematic.

The age of the physician seems to be a conflicting factor in end-of-life decision-making.[19] In our previous study, younger age was associated with an unwillingness to withhold or withdraw therapies,[17] but in this study age did not explain the decisions to choose a palliative care approach. Male gender was associated with the palliative decision when the prostate cancer patient had probable GI-bleeding and when his son was coming the next day. The influence of gender is also unclear in end-of-life decision-making, as some studies have shown that female physicians are more in favour of active treatments and in some studies there is no gender-dependent difference in withholding or withdrawing life-sustaining treatments.[11, 17, 19, 20, 28]

Only approximately 10% of the respondents in both years considered costs of care to influence their decisions, and the patient's social status was even less influential. Some studies do report that a patient's financial resources influence physicians' decision-making,[29] while our results probably reflect the Finnish health care system, where the cost of care are covered by the society with tax money. The influence of a patient's age decreased during the years studied. This finding is likely due to the advances in medicine in recent years. In contrast to older studies where age significantly influenced patient survival in critical illnesses,[30, 31] the survival of cancer patients was not associated with age in a recent study by Martos-Benítez et al.[32]

The influence of patient's benefit to physicians' decision-making rose to 99% from an already high percentage of 96%, while family's benefit decreased from 37% to 25% between the years studied. The rise

of individualism in western parts of the world might reflect this change, as well as the fact that today respecting the patient's wishes is one of the main principles in the ethical guidelines of the Finnish Medical Association.[1, 2, 33] Both patient's and physician's legal protection was considered more influential now than sixteen years ago. In Finland, patient's rights regarding treatment decisions were incorporated into Finnish law in 1992,[7] which has obviously impacted the high level of influence of the patient's legal protection. Thus, our results also raise a question as to whether physicians are more concerned about malpractice claims now than they were sixteen years ago. The data from malpractice claims is conflicting, as some studies show an increasing amount of malpractice claims, while in others there is a clear decrease.[34, 35] In contrast to our results, the law appeared to play a limited role in end-of-life medical decision-making with doctors prioritizing patient-related clinical and ethical considerations in a recent study from Australia.[36] On the other hand, that study is partly in line with our study, as ethical values were also considered to be highly influential by our responders. Our findings emphasize the complexity of end-of-life decision-making and the different factors that affect it, as physicians consider both legal and ethical aspects to be important, and one does not exclude the other.

Physicians in 2015 were more willing to give a voucher for hospice, when the breast cancer patient in EOL-care wished for it. The increase in a palliative care approach for the terminally ill prostate cancer patient might reflect the tendency to avoid futile therapies even when contrasting with the patient's wishes. This increasing willingness to give a hospice voucher may in turn be a reflection of the rise in patient-centred care where there is a focus on shared decision-making complying with patient's preferences.[4, 5, 37] The difference between the study years remained in the logistic regression analysis concerning the patient with advanced breast cancer. However, GPs were more unwilling to give a voucher compared to oncologists. In Finland, most of the dying patients are taken care of in community hospitals by GPs. Thus, our finding may reflect the better knowledge of GPs about the facilities in the community hospitals or the financial realities in the communities. On the other hand, oncologists may face the most difficult cases in EOL-care, leading to a willingness to offer specialized palliative care in a hospice. Our results call for ongoing communication between the specialties to build up palliative care pathways with optimally arranged EOL-care based on the

needs of every individual patient.

The limitations of this study need to be acknowledged. Our response rate (56%) is a limitation, due to possible nonresponse bias even though our study population was a large and representable sample of Finnish physicians. Because the follow-up period is long, it was possible to detect relevant changes in attitudes, values and decision-making. Physicians responding questions regarding hypothetical scenarios might give different answers compared to their actual decisions in clinical practice, but we suggest that the answers do sufficiently reflect real-life decision-making. However, future research should try to evaluate the basis of decision-making in the clinical practice of EOL-care and whether education in palliative care influences these decisions.

## **CONCLUSION**

Compared to 1999, physicians in 2015 were more reluctant to choose active life-prolonging treatments over palliative care approaches for short-term goals in EOL-care. However, they were more willing to give a voucher for hospice when a patient requested it. Patient's benefit, ethical values and patient's or physician's legal protection were more influential on the physicians' decision-making in 2015, while influence of family's benefit and patient's age decreased. Our findings may reflect changes in general attitudes and the medical atmosphere towards patient-centred care and the decreased importance of family and religion in Finnish society, together with a better knowledge of the principles of palliative care. The results highlight the importance of education of end-of-life care, including not only the medical facts but also the ethics related to decision-making. All of these aspects should be incorporated into post-graduate training in specialties that take care of dying patients.

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### **Authors' contributorship**

RP, JL, HH and PLKL designed the study outline and the questionnaire. RP, JL and PLKL collected the data. RP, JL, PLKL and RM analysed the data. RP and RM performed the final statistical analysis. All the authors contributed to the writing and reviewing of the manuscript and approved the final manuscript.

### **Competing Interests**

None declared.

### **Data sharing**

The datasets used and analysed during the study are available from the corresponding author on a reasonable request.

### **Ethics approval and consent to participate**

The study was approved by the Regional Ethics Committee of Tampere University Hospital, Finland (R15101) and participation was voluntary and anonymous.

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#### **Tables legends**

Table 1. Characteristics of the participants.

Table 2. Numbers and proportions of physicians choosing a palliative care approach over active/intensive care for the terminally ill patient with a prostate cancer (scenario 1) and willing to give a voucher for hospice for the advanced breast cancer patient (scenario 2).

Table 3. Factors reported by the physicians to have influenced to their decisions concerning the care of the terminally ill prostate cancer patient.

Table 4. Different background factors and attitudes explaining the decision to choose active/intensive care (n=482) over a palliative care approach (n=610) concerning the prostate cancer patient with probably iatrogenic GI-bleeding and when he is waiting to meet his son or a minister (scenarios 1a-c) in forward logistic regression analysis.

Table 5. Different background factors and attitudes explaining the willingness to give a voucher for hospice (n=488) versus not (n=610) for the patient with advanced breast cancer (scenario 2) in forward logistic regression analysis.