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Cross-cultural acceptability of interventions that may increase control at the end of life in people with dementia

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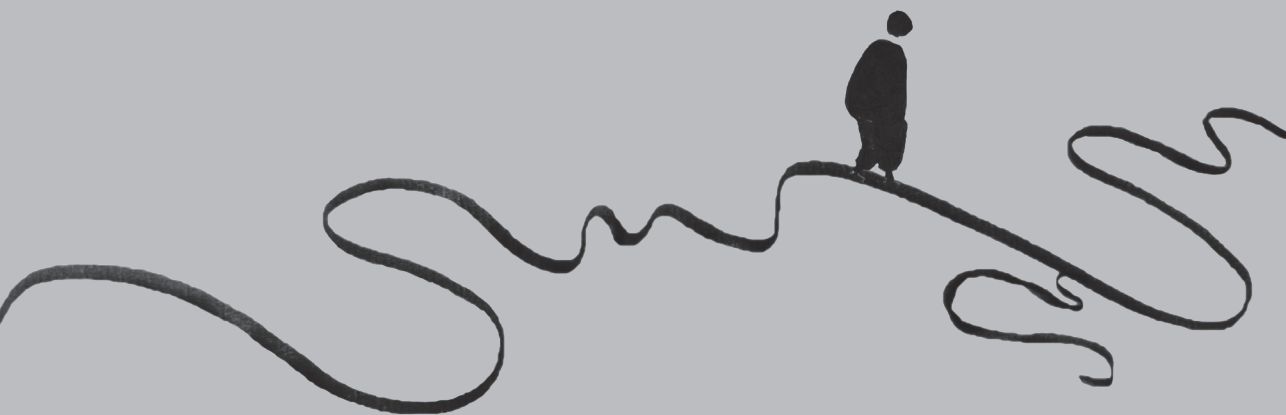
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Acceptability of euthanasia for people
with dementia: perspectives of clinicians
from six countries

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Abstract

Objectives: Euthanasia for people with dementia is controversial and clinicians should decide how to respond to euthanasia requests. We aimed to investigate clinicians' perspectives on the acceptability of euthanasia for people with dementia, and differences between countries and personal characteristics potentially associated with acceptability.

Design, Setting, Participants, Measurements: Cross-sectional vignette study as part of the CONT-END studies, in which we conducted interviews with clinicians from the Netherlands, Switzerland, Germany, USA, Japan, and Israel online or in-person, and logistic regression analyses to assess associations with acceptability.

Results: Participants included 202 physicians and three nurse specialists who assumed similar medical responsibilities. Acceptability was higher in the Netherlands (66%) than in other countries (23-44%, OR 0.16-0.41, $p = 0.003$ -0.03). Dutch clinicians were more often willing to perform euthanasia upon request of a person with dementia (58%) than clinicians in other countries (18-34%, OR 0.16-0.17, $p = 0.007$ -0.03), except for Israel (40%, OR 0.48, $p = 0.07$). Two coping styles, planning (OR 0.77, 95% CI [0.59, 1.00]) and religious coping (OR 0.71, 95% CI [0.60, 0.84]), were associated with lower acceptability of euthanasia. Being religious (OR 0.47, 95% CI [0.24, 0.93]), training in palliative care (OR 0.48, 95% CI [0.26, 0.91]), and using emotional social support as coping style (OR 0.77, 95% CI [0.62, 0.95]) were associated with lower willingness to perform euthanasia upon request of a person with dementia.

Conclusions: Clinicians' perspectives on the acceptability of euthanasia for people with dementia varied across countries and individuals, with diversity related to coping styles, training in palliative care, and religion.

Objective

Euthanasia is defined as a medical professional actively ending a person's life with medical means such as injection (1). It is equivalent to the clinician-administered form of medical assistance in dying (MAID) or practitioner-administered form of voluntary assisted dying (VAD), but does not include self-administered assisted dying, also named physician assisted suicide (PAS) (2). Euthanasia is legal or decriminalized in the Netherlands, Belgium, Luxembourg, Canada, Colombia, Spain, Portugal, New Zealand, Australia, and Ecuador, and is undergoing fierce debate in others (3-6). Euthanasia is possible for people with dementia in the Netherlands, Belgium, Luxembourg, Canada, and Colombia, mostly restricted to people with mild dementia who still have decision-making capacity (2). Although physicians generally prefer PAS to euthanasia (1), the diminishing capacity in people with dementia to communicate a wish to die and to take the medication by themselves imply that they risk being unable to access PAS in later stages (7). This creates additional challenges and an added layer of controversy around euthanasia. Previous research in Belgium suggested that physicians consider euthanasia less acceptable for people with dementia compared to those with other diseases (8). Interest in the possibility of euthanasia for people with dementia is growing (9) with the rising number of people dying with dementia (10), legalization of euthanasia in more countries (11), and an increasingly positive public opinion towards euthanasia in high-income countries (12). Insights into the opinions of clinicians from both countries where euthanasia is legal and illegal may inform social debates and policymaking, because clinicians are usually responsible for responding to euthanasia requests. A limited number of studies on euthanasia specifically for people with dementia reported lower acceptability by clinicians than the general public (8, 13-15). The acceptability has increased over time (15) and is positively associated with some clinicians' personal characteristics, such as being young, male, not having strong religious beliefs, and no training in palliative care (8, 13-15). However, research on clinicians' perspectives on the acceptability of euthanasia for dementia mainly focused on countries where euthanasia is legal (8, 14-15).

The current study investigates clinicians' views on the acceptability of euthanasia in six high-income countries with different legal statuses of euthanasia and other end-of-life options (Table 1). The research questions were: 1) Is euthanasia acceptable for people with dementia from the perspective of clinicians in these six countries? 2) Are there differences in acceptability of euthanasia for people with dementia from the perspective of clinicians between the countries? 3) Which personal characteristics of clinicians are associated with the acceptability of euthanasia for people with dementia?

Table 1. Legal status of euthanasia and other end-of-life options in the participating countries

Country	Euthanasia	Physician assisted suicide	Withdrawal of life-sustaining intervention
The Netherlands (11)	Decriminalized	Legal	Legal
Switzerland (11)	Not legal	Legal	Legal
Germany (11)	Not legal	Legal	Legal
United States (11)	Not legal	Legal in some states ^a	Legal
Japan (16)	Not legal	Not legal	Unclear ^b
Israel (17)	Not legal	Not legal	Not legal

^a Physician assisted suicide is legal in the states of Oregon, Washington, Montana, Vermont, California, Colorado, Hawaii, New Jersey, Maine, and New Mexico. Also in Washington, D.C.

^b A relevant legislative bill is not yet submitted to the National Diet due to opposition.

Methods

Study design

We conducted a mixed-methods vignette study in the Netherlands, Switzerland, Germany, USA, Japan, and Israel. Clinicians, people with dementia, and family caregivers participated in a one-time assessment including a questionnaire on personal characteristics and a semi-structured interview on the acceptability of euthanasia, advance care planning, and the use of symptom monitoring technology for people with dementia as part of the CONT-END study (18). Each topic was prompted by a brief animation video. This article reports on clinicians' acceptability rating of euthanasia following

the STROBE checklist for cross-sectional studies. The data were collected between July 2020 and January 2024.

Participants

Clinicians eligible to participate primarily included physicians with a specialty that could include end-of-life care for people with dementia. American nurse specialists from these disciplines who assume a similar level of medical responsibility as general practitioners were also included. We recruited participants through email lists and websites of the research institutes, through professional networks, and using professional connections of the authors (Supplementary Table S1) (18).

Instruments

The research team developed the animation videos with input from local collaborators, people with dementia, and older adults (18). The video illustrating the procedure and requirements for euthanasia ranged from 2 minutes 59 seconds (English) to 4 minutes 20 seconds (Japanese). The videos were translated and back-translated. Minor cultural-sensitive adjustments were described in the protocol paper (18). To prevent confusion with physician assisted suicide, we used the expression “termination of life on demand” in the US, Israel, and Japan. In Germany and Switzerland, we used “Aktive Sterbehilfe”, literally meaning active assistance in dying as the preferred term. If during the interview, the participant seemed to confuse the concept of euthanasia with physician assisted suicide or withdrawal of life-sustaining treatments, the interviewer clarified that we were studying the active ending of a person’s life by medical professionals with, for example, as injection.

Acceptability was assessed using the questions: 1) Do you consider euthanasia acceptable for people with dementia? 2) Would you use euthanasia for a patient with dementia at their request? 3) Do you think your colleagues would find euthanasia acceptable to use for a patient with dementia at their own or their family caregiver’s request? 4) Would you use euthanasia for a patient with dementia at their family caregiver’s request? 5) Would you want euthanasia for yourself if you had dementia? 6) Do you think euthanasia is currently legal where you practice? In countries other than the Netherlands,

the first five questions were accompanied with the assumption “suppose it was legal”. Participants were asked to indicate an answer of yes/no/don’t know, before they elaborated on their considerations. Primary outcome variables were whether euthanasia is considered acceptable for people with dementia from the perspective of clinicians and whether they would use it at request of a person with dementia. Since performing euthanasia at request of the family caregiver is not legal nor desirable, we did not include this as a primary outcome.

Personal characteristics included demographics, professional experience, and attitudes relevant to end-of-life care. Collected demographics consisted of age, sex, religion, and country of birth or ethnicity. During the analysis, religion was grouped into not religious (atheist, agnostic, humanist, or no specific religious background) and a group containing all other options (e.g. Catholic, Protestant, Hindu, other).

Professional experience was assessed as specialization, place where they treat people with dementia, years of experience in dementia care, whether palliative training was received after basic medical training (yes/no), number of patients with dementia who died in the last year (0/1-4/5-9/10-19/20+) and whether the participant had personally experienced a family member or friend with advanced dementia at the end-of-life (yes/no). Specialties were grouped into older person-related specialties (elderly care physician, geriatrician, psycho-geriatrician, dementia care nurse practitioner and geriatric clinical nurse specialist) and other (e.g., general practitioner, internal medicine, neurologist).

Further, we assessed comfort to talk about the end of life with people with dementia (4-point scale), comfort to talk about the end of life in general (4-point scale, don’t know), and the perspective (patient/caregiver/clinician) that is the mostly strongly considered relating to goals of future care for people with dementia (18, 19). The Locus of Control scale (IE-4) (20) comprised four items, two for internal and two for external locus of control scaled 1 to 5. Illness cognition (knowledge of dementia) was covered by 1) “dementia is a disease you can die from” (19, 21); 2) “dementia is a normal part of the ageing process” (20); and 3) “palliative care applies from the time of diagnosis to the stage of severe dementia” (21); each statement was rated on a 1-5 scale (18) and

don't know was a valid option. Attitudes towards death were measured by the 4-item Death Anxiety Questionnaire (24) and 5 items of the Death Attitude Profile-Revised (DAP-R) (25, 26) selected from the DAP-R subscales fear of death, avoidance of death, neutral acceptance of death, convergent acceptance of death, and escapist acceptance of death. Answers were scored on a 1-4 scale and a don't know option. Coping styles were measured by relevant 2-item subscales of the Brief COPE (27, 28), including active coping, planning, use of instrumental social support, use of emotional social support, denial, acceptance, and religious coping scored 1-4.

Procedures

The assessment generally consisted of 10 min for the online questionnaire, followed by 50 min for the interview. We sent a link to the online questionnaire in Castor electronic data capture (EDC; Castor, the Netherlands) via email. During the online interview, participants viewed four animation videos, each describing an intervention (i.e., two approaches to advance care planning, monitoring technology, and euthanasia) (18), and after each, answered questions about the acceptability of the interventions. The video about euthanasia was shown last due to the topic's potential sensitivity. In the Netherlands, four interviews were conducted via the telephone and one face-to-face due to technical problems with video calling or preference of the participant. To make up for delays due to the pandemic, after data collection in the Netherlands and the US was completed, we offered a fully self-reported online version in the other countries after the first 15 interviews.

Statistical analysis

We initially aimed to include 50 clinicians from each country, forming a total of 300. The power analysis was based on the larger CONT-END program to detect differences in acceptability of four interventions between 6 countries and 3 groups of participants (18). For euthanasia, 70 events of (not) acceptable would provide sufficient power, with an estimation of a 50% acceptability rate which is lower than other interventions investigated in the CONT-END program (18).

SPSS 29 and R 4.3.1 were used for the statistical analysis. Missing data were assumed to be missing at random and were treated with pairwise deletion in the exploratory analysis. The option don't know was given an average score, for example 3 on a 1-5 scale. To check the influence of the data collection methods, a sensitivity analysis was performed on the main outcome measures of the Israeli data, which included the most participants who responded to the self-reported online version.

Regression analyses were performed separately for two dependent variables: 1) whether the clinicians considered euthanasia acceptable for people with dementia, and 2) whether they would use it at request of a person with dementia. To address the research question of whether there were differences between countries, we used logistic regression with and without adjustment for age, gender, and religion. To explore associations of personal characteristics with each dependent variable, we first determined that there was a significant clustering effect by country (29). We then conducted regressions for potentially associated variables adjusted for clustering by country as part of a two-level model. Those variables with a p-value of less than 0.2 were then entered in a two-level model (countries with random intercept and personal characteristics) (30), which was trimmed by backwards regression on the personal characteristics. Wald statistics with an alpha of 0.05 were used in the backward selection. Analyses for the two-level models were conducted using the R package lme4.

We recognize the problem of overfitting (31) and model instability (32) produced by backward regression, so we performed a sensitivity analysis with Lasso regression with the R package glmnet, which compensates for possible overfitting by applying a penalty to the correlation coefficients, shrinking those of irrelevant variables to 0 (32). The optimal strength of penalty (lambda) was determined based on Bayesian information criterion. The optimal lambda of 18 was used for the regression on the acceptability of euthanasia for people with dementia, and a lambda of 22 for the regression on the willingness to use euthanasia upon request of a person with dementia.

Ethics

The study protocol is published and approved by the institutional review board or ethics committee in all country sites (18). The study is registered at the Netherlands Trial Registration (NL7985) on 31 August, 2019, currently available on the International Clinical Trial Registry Platform (NL-OMON26073). All participants provided written informed consent. Participants received gift cards for their participation. The amount was decided together with the local researcher based on common practice for similar studies (the Netherlands and Germany 15 euros, Switzerland 30 Swiss Franc, US 100 dollars, Japan 2000 yen, Israel 110 Israeli New Shekel).

Results

Demographics

A total of 202 physicians and 3 nurse specialists participated (Table 2, Supplementary Table S2). Due to the use of large email lists, websites and snowballing during recruitment, it was not possible to estimate the number of potential participants reached by the recruitment strategies. Around half of the participants (54%) were female, with more males from Japan (21 of 25; 84%) and more females from Germany 16 of 17 (94%). A great majority of participants (84%–100%) were born in the country where they practice medicine except for Switzerland (5 of 13; 39%). The participants from the US were mostly (90%) non-Hispanic Caucasian or Asian. A third of the overall participants were not religious. Clinicians practicing a specialty related to older people accounted for a third of all participants, with a higher percentage from the Netherlands (76%) than other countries (6%–26%). A great majority of the participants (81%) had cared for patients with dementia who died in the last year. The interviews lasted a median of 45 minutes (IQR 38 - 52, range 16 - 99) excluding the time viewing the animation videos.

Four single data points, each from a different participant, were missing because of refusal to answer a question by the participant, or because the interviewer forgot to ask a question. These missing data were about the acceptability of euthanasia for the participant themselves (one Dutch participant), legality of euthanasia (another Dutch participant and a German participant), and a question about planning as coping strategy (another Dutch participant).

Table 2. Characteristics of participants

	Overall (N = 205)	Netherlands (N = 50)	Switzerland (N = 13)	Germany (N = 17)	USA (N = 50)	Japan (N = 25)	Israel (N = 50)
Gender, % (N)							
Female	54 (110)	70 (35)	62 (8)	94 (16)	52 (26)	16 (4)	42 (21)
Male	46 (95)	30 (15)	38 (5)	6 (1)	48 (24)	84 (21)	58 (29)
Age, median, (interquartile range: IQR), range	42 (33-54) 26-78	48 (34-59) 26-76	46 (44-60) 36-69	46 (38-60) 26-62	33 (28-45) 26-71	48 (41-56) 30-66	36 (33-45) 26-78
Born in the country where they currently worked, % (N)	87 (134)	92 (46)	39 (5)	94 (16)	-	100 (25)	84 (42)
Religion, % (N)							
Not religious	31 (63)	46 (23)	39 (5)	29 (5)	26 (13)	60 (15)	4 (2)
Christian	34 (70)	52 (26)	62 (8)	65 (11)	40 (20)	12 (3)	4 (2)
Jewish	18 (36)	0 (0)	0 (0)	6 (1)	6 (3)	0 (0)	64 (43)
Muslim	7 (15)	0 (0)	0 (0)	0 (0)	2 (1)	0 (0)	28 (14)
Polytheist and other	10 (21)	2 (1)	0 (0)	0 (0)	26 (13)	28 (7)	0 (0)
Specialty, % (N) (more possible)							
Older person related specialties	34 (69)	78 (39)	15 (2)	6 (1)	32 (16)	8 (2)	18 (9)
Other	66 (136)	22 (11)	85 (11)	94 (16)	68 (34)	92 (23)	82 (41)
Place of practice, % (N) (more possible)							
Hospital	54 (110)	8 (4)	69 (9)	47 (8)	82 (41)	36 (9)	78 (39)
Nursing home	45 (93)	74 (37)	38 (5)	41 (7)	44 (22)	52 (13)	18 (9)
Home	41 (84)	46 (23)	23 (3)	53 (9)	26 (13)	64 (16)	40 (20)

Other (hospice, private, clinic, daycare center)	37 (76)	16 (8)	54 (7)	24 (4)	54 (27)	60 (15)	30 (15)
Years of experience in dementia care, median (IQR), range	8 (3-20) 0-44	19 (4-25) 2-38	15 (10-22) 5-40	8 (5-14) 1-31	4 (1-11) 0-44	15 (9-20) 2-30	4 (2-10) 0-40
Training in palliative care, % (N)	52 (106)	42 (21)	85 (11)	35 (6)	54 (27)	76 (19)	44 (22)
Number of their patients with dementia who died in the last year, % (N)							
0	9 (19)	8 (4)	8 (1)	0 (0)	18 (9)	4 (1)	8 (4)
1-4	34 (70)	16 (8)	15 (2)	41 (7)	36 (18)	28 (7)	56 (28)
5-9	25 (51)	36 (18)	23 (3)	35 (6)	16 (8)	32 (8)	16 (8)
10-19	17 (34)	20 (10)	39 (5)	12 (2)	16 (8)	6 (3)	6 (3)
20 or more	15 (31)	20 (10)	15 (2)	12 (2)	14 (7)	14 (7)	14 (7)
Personal experience with a family member or friend having advanced dementia at the end of their life, % (N)	56 (114)	48 (24)	69 (9)	65 (11)	60 (30)	56 (14)	52 (26)

Note: In the US, ethnicity instead of country of birth was collected and reported in the text. In Switzerland, most clinicians who were born outside of the country are from Germany.

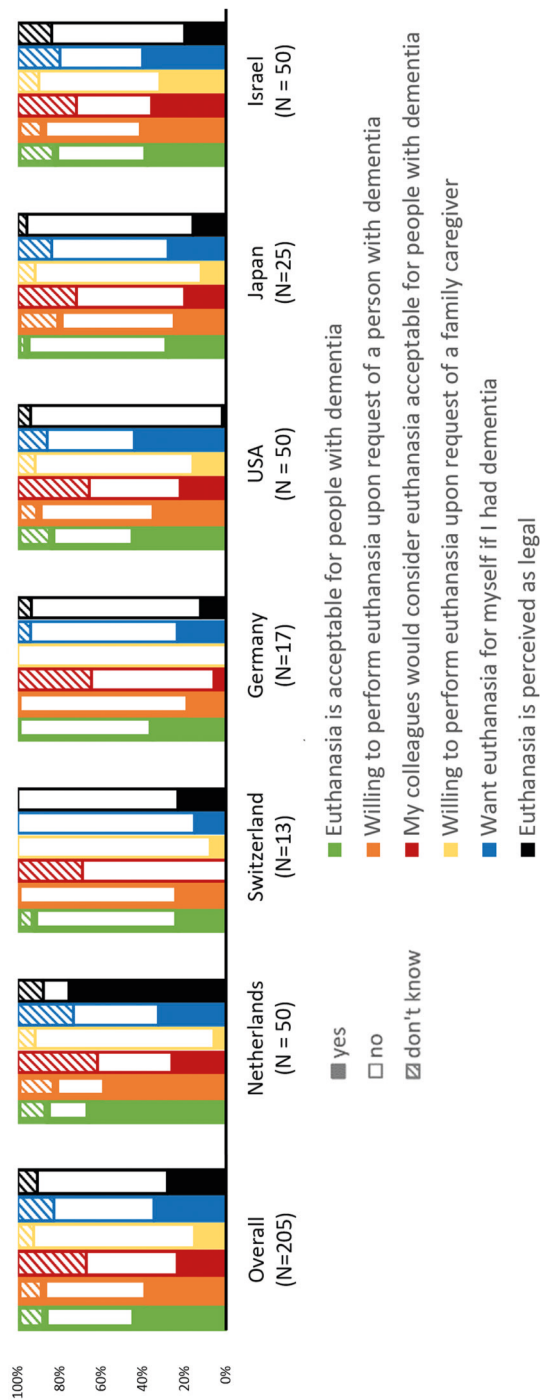


Figure 1. Acceptability of euthanasia for people with dementia from the perspective of clinicians

Acceptability of euthanasia

In total, 44% of the participants considered euthanasia acceptable for people with dementia, ranging from 23% in Switzerland to 66% in the Netherlands (Figure 1; Supplementary Table S3). Over one third (38%) of the clinicians were willing to perform euthanasia upon request of a person with dementia; ranging from 18% in Germany to 58% in the Netherlands. Twenty-three percent thought that their colleagues would consider euthanasia acceptable. Fifteen percent of participants were willing to perform it upon request of a family caregiver, ranging from none (Germany) to 32% (Israel). More (35%) of the participants would want euthanasia for themselves if they had dementia. Some clinicians in each of the countries believed that euthanasia for people with dementia was legal in their practice, up to 76% in the Netherlands. Sensitivity analysis with Israeli participants suggested that there might be some differences between those who attended interviews and those who completed the self-reported online version, although in different directions (acceptable: 47% and 34%, willing to perform upon patient request: 26% and 46% respectively).

Differences in acceptability between countries

Table 3 shows that the acceptability of euthanasia for people with dementia was higher in the Netherlands than in any of the other countries in unadjusted analysis; the differences were still significant for Switzerland and Japan after the adjustment for age, gender, and religion. Clinicians from other countries except for Israel were also less likely than Dutch clinicians to be willing to perform euthanasia upon request of a person with dementia, with or without adjustment for age, gender and religion. Considering the covariates in this analysis, clinicians who were not religious were more likely to consider euthanasia acceptable for people with dementia (OR 2.49; 95% CI [1.21, 5.13]), and willing to conduct it upon request of a person with dementia (OR 2.20; 95% CI [1.06, 4.55]).

Personal characteristics and acceptability

From the bivariable associations with the acceptability of euthanasia for people with dementia, adjusted for the clustering effect of country, we retained ($p < 0.20$): religion, practicing in the hospital, practicing in nursing homes, the perspective to consider most strongly when talking about goals of future care (patient/clinician/family), internal locus of control, avoidance of death, neutral acceptance of death, convergent acceptance of death, and five coping styles (planning, use of instrumental social support, use of emotional social support, denial, and religious coping) (Supplementary Table S4). From the bivariate associations with the willingness to perform euthanasia upon request of a person with dementia, adjusted for the clustering of country, the following variables were retained ($p < 0.20$): age, religion, training in palliative care, number of deceased patients with dementia in the last year, practicing in the hospital, practicing in nursing homes, practicing in clinics or daycare centers, avoidance of death, convergent acceptance of death, and four coping styles (use of instrumental social support, use of emotional social support, denial, and religious coping). Gender, specialization, comfort to talk about the end of life with people with dementia, comfort to talk about the end of life in general, years of experience in dementia care, personal experience with dementia at the end of life, and illness cognition did not show bivariable associations with the two main outcomes and were not included in the models.

Multivariable selection (Table 4) identified the coping styles planning (OR 0.77; 95% CI [0.59, 1.00]) and religious coping (OR 0.71; 95% CI [0.60, 0.84]) as independently associated with the acceptability of euthanasia for people with dementia. The willingness to use euthanasia upon request of a person with dementia was associated with not being religious (OR 2.12; 95% CI [1.07, 4.20]), no training in palliative care (OR 0.48; 95% CI [0.26, 0.91]), and less use of emotional social support as coping style (OR 0.77; 95% CI [0.62, 0.95]). The more conservative lasso regression retained only religious coping in both models.

Table 3. Associations between country and acceptability of euthanasia, unadjusted and adjusted for age, gender, and religion (N=205)

Country	Acceptable for people with dementia from clinicians' perspective				Willing to perform it upon request of a person with dementia				
	N (%)	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value	N (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	P-value
Netherlands	33 (66)	1	-	1	-	29 (58)	1	1	-
Switzerland	3 (23)	0.16 (0.04-0.64)	0.01	0.15 (0.04-0.64)	0.01	3 (23)	0.22 (0.05-0.89)	0.22 (0.05-0.95)	0.04
Germany	6 (35)	0.28 (0.09-0.89)	0.03	0.31 (0.09-1.00)	0.05	3 (18)	0.16 (0.04-0.61)	0.17 (0.04-0.68)	0.01
USA	22 (44)	0.41 (0.18-0.91)	0.03	0.48 (0.20-1.17)	0.11	17 (34)	0.37 (0.17-0.84)	0.33 (0.13-0.82)	0.02
Japan	7 (28)	0.20 (0.07-0.57)	0.003	0.17 (0.05-0.52)	0.002	6 (24)	0.23 (0.08-0.67)	0.17 (0.05-0.54)	0.003
Israel	19 (38)	0.32 (0.14-0.72)	0.006	0.46 (0.18-1.12)	0.11	20 (40)	0.48 (0.22-1.07)	0.51 (0.20-1.32)	0.17

Notes: OR = odd ratio, CI = confidence interval. AIC of the models were 277 (acceptability unadjusted), 277 (acceptability adjusted), 269 (willingness unadjusted), and 266 (willingness adjusted) respectively. Results with $p < 0.05$ are bolded.

Table 4. Independent associations with acceptability of euthanasia

	OR (95% CI)	P-value	Wald
Acceptability of euthanasia for people with dementia from clinicians' perspective			
Religious coping (scale 2-10)	0.71 (0.60, 0.84)	<0.001	16.23
Planning as coping (scale 2-10)	0.77 (0.59, 1.00)	0.05	3.93
Willingness to use euthanasia upon request of people with dementia			
Use of emotional social support as coping (scale 2-10)	0.77 (0.62, 0.95)	0.02	5.60
Training in palliative care (no as reference)	0.49 (0.26, 0.91)	0.02	5.18
Not religious (reference: choosing and affiliation other than atheist, agnostic, humanist, or no specific religious background)	2.12 (1.07, 4.20)	0.03	4.68

Note: Country random effect variance (variance, SE): 0.16 (0.40) for the model on acceptability of euthanasia for people with dementia and 0.17 (0.41) for the model on willingness to use euthanasia upon request of people with dementia. Model fit values (AIC, BIC, Log-likelihood) were 261, 275, -127 for the first model and 262, 278, and -126 for the second model respectively.

Conclusions

Across the six countries, 44% of the clinicians considered euthanasia acceptable for people with dementia. Thirty-eight per cent expressed willingness to perform euthanasia upon request of a person with dementia. Dutch clinicians were more likely to consider euthanasia acceptable compared to Swiss and Japanese clinicians. They were also more likely to be willing to perform euthanasia compared to Switzerland, Germany, US, and Japan. Exploratory analysis showed that more use of the coping styles planning and religious coping were associated with lower acceptability of euthanasia for people with dementia. Willingness to perform euthanasia upon request of a person with dementia was associated with reporting no religion, no training in palliative care, and less use of emotional social support as coping style.

Consistent with previous research, Dutch clinicians reported the highest acceptability compared to other countries (12). Since the Netherlands is the only country in this study where euthanasia has been decriminalized, we cannot disentangle influence of legality in country comparisons. The overall acceptability in our study is higher than in a Dutch survey in 2016 with 1147 physicians (13), but similar to a survey in 2017 with 136 Quebec physicians (14).

This might be due to potential selection bias in smaller studies. Participants of our study, for example, perceived themselves to be more accepting of euthanasia than their colleagues. Generalization of the results should therefore be done with caution. The results of this study suggest that opinions on euthanasia for people with dementia are diverse. Policy may need to consider the wishes and needs of clinicians both for and against this practice.

The questions of this study also did not specify factors such as capacity and the stage of dementia that clinicians might find important in deciding on acceptability of euthanasia for people with dementia. Previous research indicated that Dutch clinicians were more conservative when the dementia advances, while Belgian clinicians showed the opposite attitudes (8). There is tension between respecting the autonomy of the person with dementia who requested euthanasia earlier because they consider living with advanced dementia involves unbearable suffering versus protecting vulnerable incompetent individuals by properly assessing their current suffering and avoiding undue influence from relatives (8, 34). Future research and societal discussions are needed to find ways that mitigate this tension.

This study brought new insights on the potential role of coping style in the acceptability of euthanasia, building on previous knowledge that emotional burden is an important determinant of the willingness to perform euthanasia (35). Surprisingly, planning as a coping strategy of clinicians was negatively associated with the acceptability of euthanasia, which is usually a result of the person with dementia planning for their death. The mechanism of associations between coping strategies and acceptability of euthanasia may need to be explored in future research.

In line with prior research which focused on people with advanced dementia, we found that clinicians who report a religion (8, 13-14) or training in palliative care (14) were less likely to consider euthanasia acceptable. Palliative care training may bring more knowledge and skills to relieve suffering (14), and palliative care does not include hastening death by its current definition (36). Contrary to earlier studies, age (8, 14), gender (13) and practicing in a hospital (14) or nursing home (13) were not significantly associated with acceptability after the adjustment for other personal characteristics, possibly due to limited

sample size of the current study. These results imply that if adherence to religion and rates of palliative care changes, we may observe a shift in clinicians' acceptability of euthanasia for people with dementia. Globally, the percentage of people with religion is relatively stable (37), but as palliative care is being promoted (38), clinicians might show more reservation in providing euthanasia for people with dementia. On the other hand, the general public, who have a more positive attitude towards euthanasia, still has poor understanding of palliative care (12, 39). We recommend improving access to palliative care and public education on options to alleviate unbearable suffering, such as palliative sedation, in order to facilitate better informed decision making and to ease tensions between divergent attitudes of clinicians and the public. A strength of the study is the comparison between six high-income countries which shows the diversity of attitudes towards euthanasia for people with dementia and adds to the limited literature on this topic of growing importance. The exploration of a variety of personal characteristics indicated understudied factors associated with acceptability. We recruited a sample interested in end of life or palliative care in dementia, not in particular or only interested in euthanasia. Future research may compare the opinions of frontline clinicians with those of ethical and legal experts. A limitation of the study is that the planned sample size was not reached in Switzerland, Germany, and Japan after exhausting the recruitment possibilities within the duration of the study. The willingness of clinicians to participate in the study was limited due to heavy clinical duties during Covid. To ensure the understanding of the concept of euthanasia, we provided clear explanations in the animation video and clarification of interviewers. However, we cannot rule out that some participants might still have based their answers on a broader conceptualization which may include physician assisted suicide and withdrawal of life-sustaining interventions. This may have resulted in a higher acceptability rate and a number of participants perceiving euthanasia to be legal in their country when it is not. Lastly, no low- and middle-income countries were included. The acceptability in these countries, where the majority of people living with dementia in the world reside (40), can be examined in future studies. Different results may be expected in countries with a less comprehensive healthcare systems and higher religiosity.

In summary, close to half of clinicians from the Netherlands, Switzerland, USA, Germany, Japan, and Israel considered euthanasia acceptable for people with dementia. Dutch clinicians reported the highest acceptability. In this international study, not being religious, training in palliative care, and several coping strategies were associated with acceptability. These factors can be taken into consideration in policy on euthanasia for people with dementia.

Declarations

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Author contributions

JS, XJ, HS, MN, SA, LR, JG, WA, and DM were involved in the conception and design of the study. All authors contributed to the acquisition of subjects. XJ and HS were involved in the acquisition of data. XJ, HS, MN, DM, and JS analyzed and interpreted the data. XJ drafted the manuscript. All authors critically reviewed the manuscript and approved of the final version. All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Data Sharing Statement

The data is currently unavailable because the authors have not finished using them for their own purposes.

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Supplementary Table S1. Recruitment strategies per country

Country	Recruitment strategies	Areas of recruitment
The Netherlands	Email through the networks of Leiden University Medical Center (LUMC), including the general practitioner network Extramural LUMC Academic Network (ELAN), the academic long-term care network University Network for the Care sector South Holland (UNC-ZH), and the Specialist training program for “Elderly Care” Medicine (SOOL).	South Holland
Switzerland	Personal contacts of the authors, snowballing	Whole country
Germany	Personal contacts of the authors and students, snowballing	Noordrijn-Westfalen and Nedersaksen
USA	Email lists of the American Geriatrics Society and the American College of Physicians – Missouri section, emails to selected practitioners at the University of Missouri School of Medicine, personal contacts of the authors, snowballing.	Mainly Missouri and surrounding states, snowballing also reached New York and Texas
Japan	Website of Tohoku University, personal contacts of the authors and students, snowballing	Whole country, mainly Tohoku and Nagasaki
Israel	Personal contacts of the authors, snowballing	Whole country

Supplementary Table S2. Characteristics of participants cont.

	Overall (N = 205)	Netherlands (N = 50)	Switzerland (N = 13)	Germany (N = 17)	USA (N = 50)	Japan (N = 25)	Israel (N = 50)
Comfort talking about end-of-life care for people with dementia and family caregivers, % (N)							
Very comfortable	42 (85)	66 (33)	62 (8)	18 (3)	42 (21)	28 (7)	26 (13)
Moderately comfortable	42 (86)	32 (16)	38 (5)	71 (12)	34 (17)	56 (14)	44 (22)
Moderately uncomfortable	16 (32)	2 (1)	0 (0)	12 (2)	20 (10)	16 (4)	30 (15)
Very uncomfortable	1 (2)	0 (0)	0 (0)	0 (0)	4 (2)	0 (0)	0 (0)
Comfort talking about the end of life in general, % (N)							
Very comfortable	48 (98)	54 (27)	69 (9)	29 (5)	58 (29)	36 (9)	38 (19)
Somewhat comfortable	31 (63)	40 (20)	31 (4)	35 (6)	22 (11)	36 (9)	26 (13)
Somewhat uncomfortable	19 (38)	4 (2)	0 (0)	35 (6)	18 (9)	24 (6)	30 (15)
Very uncomfortable	2 (4)	2 (1)	0 (0)	0 (0)	2 (1)	2 (1)	2 (1)
I don't know	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (2)
Perspective most strongly considered relating to goals of future care, % (N)							
Person with dementia	81 (165)	92 (46)	100 (13)	82 (14)	98 (49)	68 (17)	52 (26)
Family caregiver	9 (18)	2 (1)	0 (0)	12 (2)	2 (1)	32 (8)	12 (6)
What I as physician wish for the person with dementia	6 (13)	0 (0)	0 (0)	6 (1)	0 (0)	0 (0)	24 (12)
Don't know	4 (9)	6 (3)	0 (0)	0 (0)	0 (0)	0 (0)	12 (6)
Internal locus of control (scale 2-10), median (IQR), range	8 (7-8) 3-10	8 (7-8) 6-10	7 (6-8) 4-9	8 (8-9) 6-10	8 (6-8) 3-10	7 (6-7) 5-10	8 (7-8) 3-10
External locus of control (scale 2-10), median (IQR), range	5 (4-6) 2-10	5 (4-6) 3-8	5 (4-5) 3-7	5 (3-6) 3-6	5 (4-6) 2-8	5 (4-5) 3-7	5 (5-6) 3-10

Supplementary Table S2. Characteristics of participants cont. (continued)

	Overall (N = 205)	Netherlands (N = 50)	Switzerland (N = 13)	Germany (N = 17)	USA (N = 50)	Japan (N = 25)	Israel (N = 50)
Illness cognition (scale 3-15), median (IQR), range	12 (11-14) 4-15	12 (11-14) 6-15	13 (11-15) 11-15	13 (12-14) 8-15	13 (11-14) 4-15	12 (11-12) 8-14	11 (9-12) 5-15
Attitudes towards death, median (IQR), range							
Death anxiety (scale 4-20)	9 (6-11) 4-16	8 (5-11) 4-15	9 (6-11) 5-13	9 (2) 4-13	7 (6-12) 4-16	9 (2) 5-13	10 (8-12) 4-14
Fear of death (scale 1-5)	2 (1-3) 1-5	2 (1-3) 1-3	2 (1-3) 1-4	2 (2-3) 1-4	2 (1-3) 1-4	2 (1-3) 1-4	2 (2-3) 1-5
Avoidance of death (scale 1-5)	1 (1-2) 1-5	1 (1-1) 1-4	1 (1-2) 1-2	2 (1-2) 1-3	2 (1-3) 1-5	2 (1-2) 1-4	2 (1-3) 1-5
Neutral acceptance of death (scale 1-5)	3 (3-4) 1-5	4 (3-4) 1-5	4 (3-4) 2-5	3 (3-4) 2-4	3 (3-4) 2-5	4 (3-4) 2-5	3 (3-4) 2-5
Convergent acceptance of death (scale 1-5)	2 (1-4) 1-5	2 (1-3) 1-5	2 (1-3) 1-5	2 (1-4) 1-5	3 (1-5) 1-5	2 (1-4) 1-5	3 (1-4) 1-5
Escapist acceptance of death (scale 1-5)	2 (1-3) 1-5	1 (1-3) 1-5	2 (1-3) 1-5	1 (1-2) 1-3	2 (1-3) 1-5	2 (1-3) 1-5	2 (1-3) 1-5
Coping Styles (scale 2-10), median (IQR), range							
Active coping	7 (6-8) 4-8	6 (6-7) 4-8	7 (6-8) 6-8	7 (6-8) 4-8	7 (6-8) 4-8	6 (6-7) 5-8	7 (6-8) 5-8
Planning	7 (6-8) 3-8	7 (6-8) 3-8	7 (6-8) 4-8	7 (7-8) 5-8	7 (6-8) 4-8	7 (6-8) 5-8	7 (6-8) 4-8

Supplementary Table S2. Characteristics of participants cont. (continued)

	Overall (N = 205)	Netherlands (N = 50)	Switzerland (N = 13)	Germany (N = 17)	USA (N = 50)	Japan (N = 25)	Israel (N = 50)
Use of instrumental social support	6 (5-7) 2-8	6 (5-6) 2-8	6 (5-8) 4-8	6 (5-7) 4-8	6 (5-7) 2-8	6 (5-6) 4-8	6 (5-7) 2-8
Use of emotional social support	6 (5-7) 2-8	6 (5-6) 3-8	7 (6-8) 4-8	7 (6-7) 4-8	6 (4-6) 2-8	6 (5-6) 4-8	6 (4-7) 2-8
Denial	2 (2-3) 2-8	2 (2-2) 2-3	2 (2-3) 2-4	3 (2-4) 2-5	2 (2-2) 2-4	2 (2-3) 2-4	3 (2-4) 2-8
Acceptance	6 (6-7) 2-8	7 (6-7) 4-8	6 (3-7) 2-8	6 (6-7) 5-8	6 (6-8) 4-8	6 (6-7) 5-8	6 (6-8) 3-8
Religious coping	4 (3-6) 2-8	3 (2-5) 2-8	4 (3-5) 2-7	4 (2-5) 2-7	4 (3-7) 2-8	4 (3-5) 2-7	5 (3-6) 2-8

Supplementary Table S3. Acceptability of euthanasia among physicians in six countries as presented in Figure 1

	Overall (N = 205)	Netherlands (N = 50)	Switzerland (N = 13)	Germany (N = 17)	USA (N = 50)	Japan (N = 25)	Israel (N = 50)
Euthanasia is acceptable for people with dementia from physician's perspective, N (%)							
Yes	90 (44)	33 (66)	3 (23)	6 (35)	22 (44)	7 (28)	19 (38)
No	89 (43)	10 (20)	9 (69)	11 (65)	20 (40)	17 (68)	22 (44)
Don't know	26 (13)	7 (14)	1 (8)	0 (0)	8 (16)	1 (4)	9 (18)
Willing to perform euthanasia upon request of a person with dementia, N (%)							
Yes	78 (38)	29 (58)	3 (23)	3 (18)	17 (34)	6 (24)	20 (40)
No	102 (50)	12 (24)	10 (77)	14 (82)	28 (56)	14 (56)	24 (48)
Don't know	25 (12)	9 (18)	0 (0)	0 (0)	5 (10)	5 (20)	6 (12)
Whether my colleagues would consider euthanasia acceptable for people with dementia, N (%)							
Yes	48 (23)	13 (26)	0 (0)	1 (6)	11 (22)	5 (20)	18 (36)
No	90 (44)	18 (36)	9 (69)	10 (59)	22 (44)	13 (52)	18 (36)
Don't know	67 (33)	19 (38)	4 (31)	6 (35)	17 (34)	7 (28)	14 (28)
Willing to perform euthanasia upon request of a family caregiver, N (%)							
Yes	31 (15)	3 (6)	1 (8)	0 (0)	8 (16)	3 (12)	16 (32)
No	159 (78)	43 (86)	12 (92)	17 (100)	38 (76)	20 (80)	29 (58)
Don't know	15 (7)	4 (8)	0 (0)	0 (0)	4 (8)	2 (8)	5 (10)
Want euthanasia for myself if I had dementia, N (%)							
Yes	71 (35)	16 (33)	2 (15)	4 (24)	22 (44)	7 (28)	20 (40)
No	98 (48)	20 (41)	11 (85)	12 (71)	21 (42)	14 (56)	20 (40)
Don't know	35 (17)	13 (27)	0 (0)	1 (6)	7 (14)	4 (16)	10 (20)
Missing	1 (0)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Supplementary Table S3. Acceptability of euthanasia among physicians in six countries as presented in Figure 1 (continued)

	Overall (N = 205)	Netherlands (N = 50)	Switzerland (N = 13)	Germany (N = 17)	USA (N = 50)	Japan (N = 25)	Israel (N = 50)
Whether euthanasia is perceived as legal, N (%)							
Yes	57 (28)	37 (76)	3 (23)	2 (13)	1 (2)	4 (16)	10 (20)
No	127 (62)	6 (12)	10 (77)	13 (81)	46 (92)	20 (80)	32 (64)
Don't know	19 (9)	6 (12)	0 (0)	1 (6)	3 (6)	1 (4)	8 (16)
Missing	1 (0)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Supplementary Table S4 Bivariable associations between clinician's personal characteristics and acceptability of euthanasia, adjusted for clustering of country

Personal characteristics	Acceptability of euthanasia
	Fixed effect (level 1)
	OR (80% CI)*, <i>p</i> -value
Age	1.00 (0.99, 1.02), 0.93
Sex (female as reference)	1.03 (0.69, 1.53), 0.92
Not religious (reference: choosing and affiliation other than atheist, agnostic, humanist, or no specific religious background)	2.25 (1.46, 3.48), 0.02
Specialization (older people related specialties as reference)	0.76 (0.46, 1.26), 0.49
Training in palliative care (no as reference)	0.83 (0.57, 1.21), 0.53
Comfort to talk about the end of life with people with dementia	0.85 (0.65, 1.11), 0.45
Years of experience in dementia care	1.01 (0.99, 1.03), 0.55
Number of deceased patients with dementia in the last year (0 as reference)	
1-4	1.23 (0.73, 2.08), 0.61
5-9	1.19 (0.73, 1.94), 0.65
10-19	1.17 (0.76, 1.81), 0.64
20 or more	0.86 (0.58, 1.28), 0.63
Practicing in hospital	0.41 (0.26, 0.65), 0.01
Practicing in nursing home	0.36 (0.14, 0.94), 0.17
Practicing in home setting	1.73 (0.77, 3.87), 0.38
Practicing in other settings (clinic or day care)	0.72 (0.48, 1.08), 0.31
Personal experience with dementia at the end of life (no as reference)	0.90 (0.62, 1.31), 0.71
Most strongly considered perspective relating to goals of future care for people with dementia (patient as reference)	
Family	0.41 (0.19, 0.90), 0.15
Myself as physician	0.67 (0.28, 1.59), 0.55
Don't know	4.41 (1.49, 13.08), 0.08
Comfort talking about the end of life in general	0.82 (0.65, 1.03), 0.27
Internal locus of control	1.21 (1.03, 1.42), 0.13
External locus of control	1.00 (0.86, 1.17), 0.97
Illness cognition	1.00 (0.92, 1.09), 0.95

for people with dementia from clinicians' perspective		Willingness to use euthanasia upon request of people with dementia	
Random effect (level 2: country)		Fixed effect (level 1)	Random effect (level 2: country)
Variance (SE) of intercept		OR (80% CI)*, <i>p</i> -value	Variance (SE) of intercept
0.22 (0.47)		0.98 (0.96, 1.00), 0.10	0.24 (0.49)
0.22 (0.47)		1.21 (0.81, 1.80), 0.53	0.24 (0.49)
0.23 (0.49)		2.16 (1.39, 3.36), 0.03	0.27 (0.52)
0.14 (0.38)		1.51 (0.89, 2.55), 0.31	0.37 (0.60)
0.20 (0.45)		0.53 (0.36, 0.78), 0.03	0.18 (0.43)
0.19 (0.44)		1.08 (0.82, 1.42), 0.72	0.24 (0.49)
0.21 (0.45)		0.99 (0.97, 1.01), 0.46	0.25 (0.50)
0.23 (0.48)			0.19 (0.44)
		1.36 (0.80, 2.30), 0.46	
		1.44 (0.89, 2.34), 0.34	
		0.96 (0.61, 1.51), 0.90	
		1.97 (1.32, 2.94), 0.03	
0.00 (0.00)		0.56 (0.36, 0.88), 0.10	0.00 (0.00)
0.17 (0.42)		0.40 (0.16, 0.98), 0.19	0.23 (0.48)
0.51 (0.71)		0.52 (0.23, 1.18), 0.31	0.15 (0.39)
0.18 (0.43)		0.60 (0.39, 0.91), 0.13	0.16 (0.40)
0.21 (0.46)		1.15 (0.78, 1.69), 0.64	0.24 (0.48)
0.16 (0.39)			0.22 (0.47)
		1.00 (0.49, 2.06), 1.00	
		1.05 (0.46, 2.40), 0.94	
		1.08 (0.43, 2.73), 0.91	
0.20 (0.45)		0.97 (0.77, 1.23), 0.88	0.22 (0.47)
0.21 (0.46)		1.00 (0.85, 1.18), 1.00	0.22 (0.47)
0.22 (0.47)		1.11 (0.95, 1.30), 0.42	0.20 (0.45)
0.22 (0.47)		0.96 (0.88, 1.05), 0.55	0.21 (0.46)

Supplementary Table S4 Bivariable associations between clinician's personal characteristics and acceptability of euthanasia, adjusted for clustering of country (continued)

	Acceptability of euthanasia
Personal characteristics	Fixed effect (level 1)
<i>Attitude towards death</i>	
Death anxiety	1.00 (0.94, 1.07), 0.98
Fear of death	0.89 (0.73, 1.08), 0.45
Avoidance of death	1.26 (1.02, 1.55), 0.15
Neutral acceptance of death	1.27 (1.04, 1.55), 0.12
Convergent acceptance of death	0.87 (0.77, 0.98), 0.14
Escapist acceptance of death	0.87 (0.73, 1.04), 0.33
<i>Coping style</i>	
Active coping	0.89 (0.75, 1.05), 0.38
Planning	0.79 (0.67, 0.93), 0.06
Use of instrumental social support	0.82 (0.72, 0.94), 0.07
Use of emotional social support	0.84 (0.74, 0.96), 0.09
Denial	0.78 (0.62, 0.98), 0.15
Acceptance	0.99 (0.85, 1.15), 0.95
Religious coping	0.71 (0.64, 0.79), <0.001

*80% confidence interval was reported because the variables were selected for the backward regression based on the criteria $p < 0.20$. Results with $p < 0.20$ are bolded.

for people with dementia from clinicians' perspective	Willingness to use euthanasia upon request of people with dementia	
Random effect (level 2: country)	Fixed effect (level 1)	Random effect (level 2: country)
0.22 (0.47)	1.01 (0.94, 1.08), 0.91	0.23 (0.48)
0.20 (0.45)	0.84 (0.69, 1.03), 0.25	0.21 (0.46)
0.27 (0.52)	1.25 (1.02, 1.54), 0.17	0.26 (0.51)
0.22 (0.47)	1.20 (0.98, 1.47), 0.25	0.22 (0.47)
0.21 (0.46)	0.82 (0.72, 0.93), 0.04	0.24 (0.49)
0.21 (0.46)	1.10 (0.92, 1.31), 0.49	0.22 (0.47)
0.21 (0.45)	0.85 (0.72, 1.01), 0.21	0.21 (0.46)
0.18 (0.42)	0.86 (0.73, 1.01), 0.24	0.18 (0.43)
0.19 (0.44)	0.85 (0.74, 0.98), 0.12	0.20 (0.45)
0.20 (0.45)	0.76 (0.66, 0.87), 0.01	0.19 (0.44)
0.17 (0.41)	0.77 (0.61, 0.97), 0.14	0.19 (0.44)
0.22 (0.47)	1.09 (0.94, 1.27), 0.46	0.22 (0.47)
0.20 (0.45)	0.77 (0.69, 0.86), 0.002	0.23 (0.48)