Quality of Life and Recommendations for Further Care

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Objectives: Physician recommendations for further medical treatment or palliative treatment only at the end of life may influence patient decisions. Little is known about the patient characteristics that affect physician-assessed quality of life or how such assessments are related to subsequent recommendations.

Design, Setting, and Subjects: A 2010 mailed survey of practicing U.S. physicians (1,156/1,878 or 62% of eligible physicians responded).

Measurements and Main Results: Measures included an end of life vignette with five experimentally varied patient characteristics: setting, alimentation, pain, cognition, and communication. Physicians rated vignette patient quality of life on a scale from 0 to 100 and indicated whether they would recommend continuing full medical treatment or palliative treatment only. Cognitive deficits and alimentation had the greatest impacts on recommendations for further care, but pain and communication were also significant (all $p < 0.001$). Physicians who recommended continuing full medical treatment rated quality of life three times higher than those recommending palliative treatment only (40.41 vs 12.19; $p < 0.01$). Religious physicians were more likely to assess quality of life higher and to recommend full medical treatment.

Conclusions: Physician judgments about quality of life are highly correlated with recommendations for further care. Patients and family members might consider these biases when negotiating medical decisions. (*Crit Care Med* 2016; XX:00–00)

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Patient quality of life may play an important role in physician recommendations for further life sustaining treatments at the end of life. The limited efficacy of such treatments (1, 2) and an emphasis on quality of life together have led to greater use of palliative care resources and more frequent decisions to limit care (3–7). Physician recommendations often play an integral role in such choices, as patients require information about prognosis, treatment efficacy, and quality of life to make informed decisions (8, 9). How physicians perceive and make judgments about patient quality of life may impact the recommendations physicians offer, but few studies have investigated this at a national level.

Prior studies have observed significant associations between patient quality of life and do-not-resuscitate (DNR) orders (10–13), but this may be due to patient—as opposed to physician—preference. Some studies of DNR orders neglected to consider patient quality of life (14, 15), whereas others were small (15–18) or in foreign countries (11, 17). In a small Swiss study, physicians explicitly considered quality of life when implementing DNR orders in as many as 71% of cases (17). In the United States, single-center and regional studies have observed associations between physician assessment of quality of life and physician treatment preferences for patients (16, 18). Yet no nationally representative study has investigated U.S. physicians' assessments of quality of life or how such assessments relate to physician recommendations for further care.

We surveyed a large, nationally representative sample of practicing U.S. physicians and used an experimental vignette to investigate their appraisal of a hypothetical patient's quality of life. We then assessed their corresponding recommendations for further care. Five areas related to quality of life—setting (14), alimentation, pain (16–19), cognition (14, 17–19), and communication (18)—were experimentally varied to investigate their independent effects on physician responses. We hypothesized that higher ratings of quality of life would be associated with more aggressive recommendations for further care and that religious physicians would both rate quality of life higher and be more likely to recommend full medical treatment.

METHODS

Setting and Participants

In 2010, we mailed a self-administered, confidential questionnaire to a stratified random sample of 2016 practicing U.S. physicians 65 years old or younger. The sample was generated from the American Medical Association Physician Masterfile, a database intended to include all practicing U.S. physicians. We first selected 1,248 physicians from those with a primary specialty of internal medicine, family medicine or general practice, and cardiology or nephrology. We did not include pediatricians. We then included an oversample ($n = 768$) of physicians working in specialties that care for disproportionate numbers of patients at the end of life (hospice and palliative care, geriatrics, oncology specialties, and pulmonary/critical care). We used validated lists of South Asian, Arabic, and Jewish ethnic surnames (20, 21) to increase the number of Hindu, Muslim, and Jewish physicians in the study.

Physicians received up to three separate mailings, with a $20 cash incentive in the first and an offering of $30 for participation in the third. All data were double keyed, cross-compared, and corrected against the original questionnaires. The study was approved by the University of Chicago institutional review board.

Design Overview

An experimental vignette was constructed to independently assess five clinical variables (care setting, alimentation, pain, cognition, and speech) impacting patient quality of life. We used variable digital printing to randomly vary the five factors in the vignette. Physicians were randomized to receive 1 of 32 versions of the following (italicized text not in survey):

> JU is a 47 year old who suffered a severe hemorrhagic stroke 10 months ago. JU is now medically stable and is cared for (*care setting*: at home by family / in a nursing home). He (*alimentation:* is able to eat with assistance / is fed by a gastrostomy tube). JU has contractures (*pain:* but usually appears to be comfortable / and usually appears to be in pain). He has (*cognition:* mild cognitive deficits / severe cognitive deficits) and (*speech:* has slurred but intelligible speech / cannot speak or write).

After reading their version of the vignette, physicians responded to the following two questions regarding quality of life and recommendations for further care:

"A. As an external observer, how would you rate JU's quality of life on a scale of 0 to 100, where 0 equals no quality of life and 100 equals perfect quality of life?

Quality of Life (0–100) _____"

"B. JU is admitted to the hospital with aspiration pneumonia and acute respiratory failure. He is unable to participate in decisions and has no advance directives. At this point, if you were JU's attending physician, and his family asked for your recommendation, which of the following would you most likely recommend (check one):"

"1. JU should receive all medically appropriate treatment, including a trial of intubation and mechanical ventilation if needed." (*full medical treatment*)

"2. JU should receive medically appropriate treatment up to, but not including, intubation and mechanical ventilation." (*do not intubate*)

"3. JU should receive only palliative (comfort-directed) treatment." (*palliative treatment only*)

We constructed two binary outcome variables for recommendations for further care. The first outcome variable equals 1 for recommending full medical treatment and 0 for recommending do not intubate or palliative treatment only. The second outcome variable equals 1 for recommending full medical treatment or do not intubate, and it equals 0 for recommending palliative treatment only.

Religious affiliation categories included none, Hindu, Jewish, Muslim, Roman Catholic/Eastern Orthodox, evangelical Protestant, non-evangelical Protestant, and other religion. Importance of religion in physicians' own lives was categorized as "not very important" (for analysis, this includes "Not applicable. I have no religion"), fairly important, very important, and most important. Clinical specialty was classified as internal medicine, family medicine/general practice, cardiology, nephrology, pulmonary/critical care, hematology/oncology, and geriatrics/hospice and palliative care. Age, gender, race/ethnicity (non-Hispanic white, non-Hispanic black, Asian, Hispanic/Latino, and other), graduation school (United States vs foreign), and region (Northeast, South, Midwest, and West) were included in our analyses as controls. Respondents who left questions blank were omitted from analyses of those items.

Statistical Analysis

Case weights were included to make estimates about all U.S. physicians from these specialties. Weights accounted for oversampling by ethnic surnames and stratification by specialty, as well as modest differences in response rates by surname group, gender, and US versus foreign medical school graduation (**supplemental materials**, Supplemental Digital Content 1, http://links.lww.com/CCM/B845).

We first generated population mean estimates for responses to each survey measure. To examine the differences in quality of life rating and recommendations for further care by patient conditions, we performed a t test and chi-square test, respectively. We also conducted chi-square tests to evaluate the association between quality of life rating and recommendations for further care.

We performed multivariate analysis to estimate the effect of each experimental variable and each religious/demographic characteristic on physicians' ratings of quality of life and their recommendations for further care. We used a generalized linear model (GLM) with log link and gamma family to account for skew and outliers in quality of life assessment and to transform it to approximately normal distribution. The estimation coefficients for quality of life assessment from the GLM were converted into average marginal effects (AME) to improve interpretability. The AME represents the difference in the adjusted predictions of the quality of life assessment between the reference groups and the comparison groups when all other covariates are held constant. AME is statistically significant (i.e.

$p < 0.05$) if the 95% CI does not cross zero. For recommendations for further care, we used a logit model for analysis.

All analyses take into account survey design and case weights and were performed using Stata MP v.14 (Stata, College Station, TX).

RESULTS

Of the 2,016 potential respondents to the survey, 138 were ineligible because they had retired or could not be contacted because of incorrect addresses. Among eligible physicians, the response rate was 61.6% (1156/1878). Female and Jewish physicians and those who graduated from U.S. medical schools were more likely to respond to the survey ($p < 0.05$ for all), whereas response rates did not differ significantly by age and region. Among respondents, the five patient conditions in the experimental vignette remained balanced (i.e., setting: 51/49; alimentation: 49/51, pain: 50/50, cognition: 52/48, and speech: 50/50).

Table 1 describes demographic and religious characteristics of the physicians. In **Figure 1**, quality of life ratings were significantly affected by all five experimental variables ($p < 0.03$). Quality of life ratings were most affected by cognitive deficits (mean 32.5 for mild deficits vs 22.8 for severe deficits) and least affected by care setting (29.2 for home vs 26.0 for nursing home). In **Figure 2**, recommendations for further care were significantly affected by all experimental variables ($p < 0.001$) except care setting ($p = 0.40$) and were again most affected by cognitive deficits (38% recommended full medical treatment for mild cognitive deficit versus 22% for severe).

It is noteworthy that quality of life rating and recommendations for further care were significantly correlated. Physicians recommending full medical treatment had a significantly higher mean quality of life rating (40.41; SE = 1.50) than those who recommended do not intubate (25.79; SE = –0.91) or palliative treatment only (12.19; SE = 1.03; $p < 0.001$).

Table 2 shows the association of patient conditions and physicians' religious characteristics with quality of life ratings and recommendations for further care. All five patient conditions significantly affected quality of life rating. For example, given

TABLE 1. Respondent Characteristics of 1,156 Practicing U.S. Physicians, 2010–2011

Demographic and Religious Characteristics	*n* (%)
Age (yr)	
24–37 (reference)	295 (26)
38–45	284 (25)
46–54	282 (24)
55–65	295 (26)
Gender	
Male (reference)	756 (65)
Female	400 (35)

(*Continued*)

TABLE 1. (*Continued*). Respondent Characteristics of 1,156 Practicing U.S. Physicians, 2010–2011

Demographic and Religious Characteristics	*n* (%)
Race/ethnicity	
White, non-Hispanic (reference)	758 (66)
Black, non-Hispanic	43 (4)
Asian	237 (21)
Hispanic/Latino	47 (4)
Other	65 (6)
Medical school	
U.S. medical school (reference)	764 (66)
Foreign medical school	392 (34)
Physician specialty	
Internal medicine (reference)	313 (27)
Family medicine / general practice	287 (25)
Cardiology	65 (6)
Nephrology	35 (3)
Hematology/oncology	123 (11)
Pulmonary/critical care	198 (17)
Geriatrics/hospice and palliative care	135 (12)
Religious affiliation	
None (reference)	129 (12)
Hindu	80 (7)
Jewish	109 (10)
Muslim	110 (10)
Roman Catholic/Eastern Orthodox	295 (26)
Evangelical Protestant	85 (8)
Non-evangelical Protestant	256 (23)
Other	55 (5)
Importance of religion	
Not important (reference)	307 (27)
Fairly important	351 (31)
Very important	331 (29)
Most important	139 (12)
Region	
Northeast (reference)	279 (24)
South	378 (33)
Midwest	283 (24)
West	216 (19)

Because of rounding error and partial nonresponse, numbers in parenthesis may not add up to 1,156 or 100%, respectively.

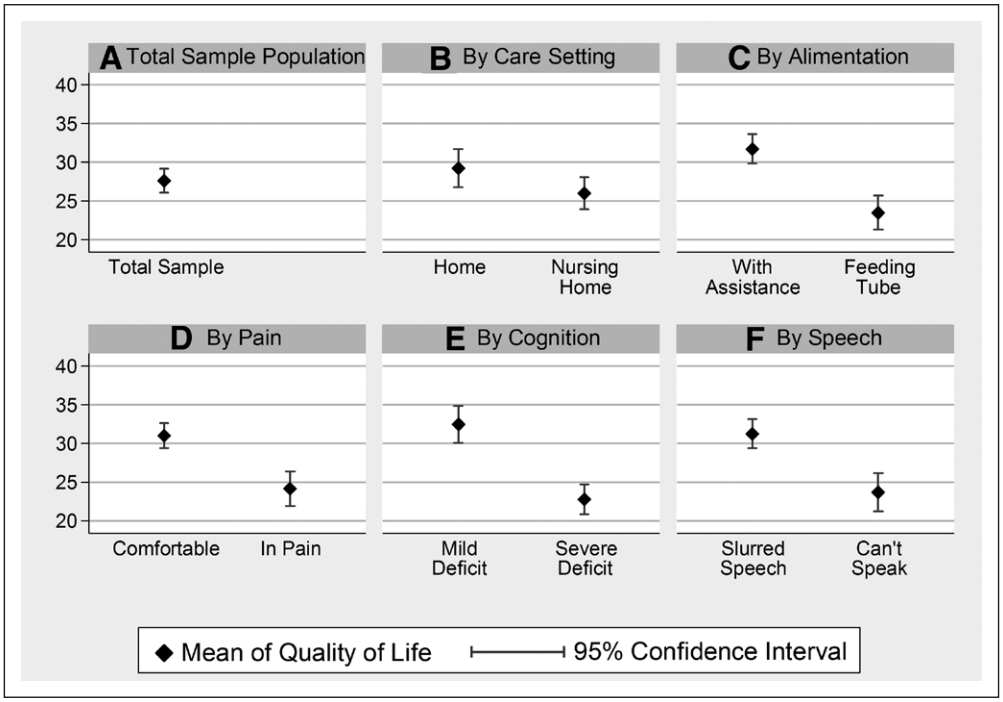

Figure 1. Assessment of quality of life by patient conditions, 2010–2011. Note: 1) The mean quality of life is the adjusted predicted values for each patient condition without controlling for any covariates in survey data analysis. 2) *p* values of *t* test are 0.03 for care setting, and < 0.001 for all other patient conditions.

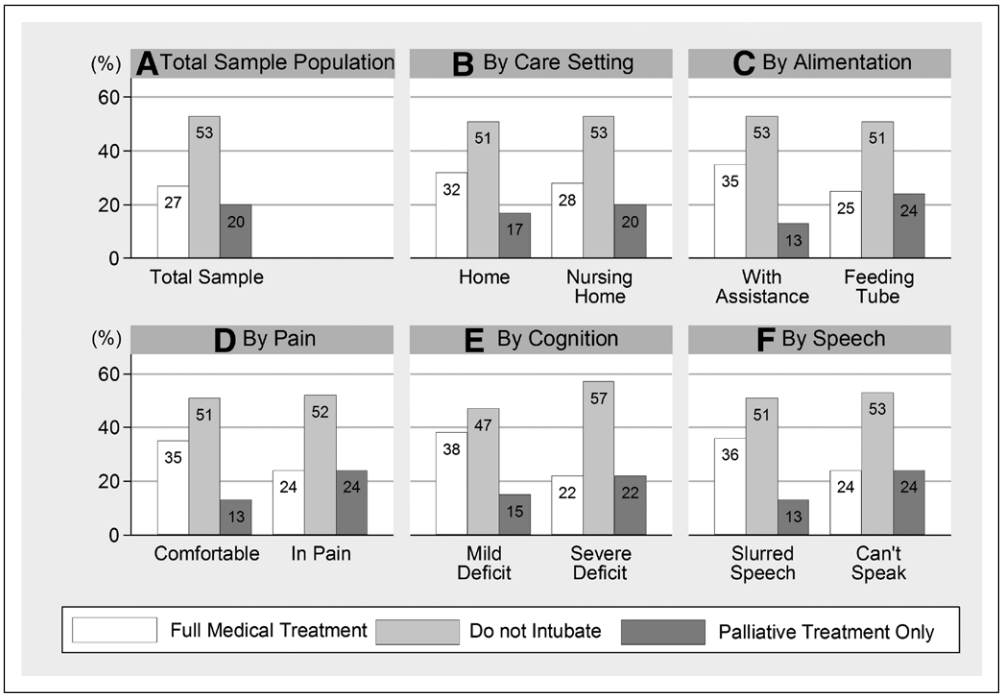

Figure 2. Recommendations for further care by patient conditions, 2010–2011. *p* values of chi-square test are 0.4 for care setting, and < 0.001 for all other patient conditions.

that the adjusted quality of life rating was 33.47 for mild cognitive deficits and 22.21 for severe deficits (results not shown in tables), the AME of cognition is –11.26 (95% CI, –14.51 to –8.00), which implies that patient quality of life rating as assessed by physicians is 11.26 units lower when the patient has severe cognitive deficits. Physicians for whom religion was very or most important rated quality of life higher than physicians for whom religion was least important (AME, 4.76; 95% CI, 0.45–9.06 and 9.25; 95% CI, 3.31–15.19, respectively).

For recommendations for further care, all patient conditions except care setting significantly affected recommendations both for full medical treatment and for a full medical treatment or do not intubate. Deficits in cognition had the most significant negative effect (odds ratio [OR], 0.41; 95% CI, 0.30–0.57) on recommending full medical treatment, whereas deficits in alimentation had the most significant negative effect on recommending full medical treatment or do not intubate (OR, 0.44; 95% CI, 0.31–0.62). Physicians were more likely to recommend full medical treatment if they were Jewish (OR, 3.09; 95% CI, 1.03–9.25) or considered religion most important (OR, 2.48; 95% CI, 1.04–5.93). However, physicians' religious characteristics were not significantly associated with recommending full medical treatment or do not intubate.

Hispanic/Latino physicians rated quality of life higher on average (AME, 8.0; 95% CI, 0.4–15.6; compared to white, results not shown in tables) and were more likely to recommend full medical treatment (OR, 2.25; 95% CI, 1.01–5.01, results not shown in table). Age, gender, and physician specialty were not associated with quality of life rating or recommendations for further care.

DISCUSSION

In this nationally representative survey of U.S. physicians, recommendations for further care in a hypothetical vignette were independently associated with cognitive deficits, pain, speech, and alimentation. Those who recommended all medically

TABLE 2. Association of Patient Conditions and Physicians' Religious Characteristics With Quality of Life Rating and Physician Recommendation for Further Medical Treatment

Patient Conditions and Physicians' Religious Characteristics	Quality of Life Rating		Recommendations for Further Medical Treatment			
			Full Medical Treatment		Full Medical Treatment or Do Not Intubate	
	Average Marginal Effect	95% CI	OR	95% CI	OR	95% CI
Patient conditions for quality of life rating						
Care setting						
Home	–	–	–	–	–	–
Nursing home	−5.31	(−8.28 to −2.35)	0.77	(0.54 to 1.11)	0.79	(0.55 to 1.14)
Alimentation						
With assistance	–	–	–	–	–	–
Feeding tube	−11.60	(−14.52 to −8.67)	0.58	(0.41 to 0.80)	0.44	(0.31 to 0.62)
Pain						
Comfortable	–	–	–	–	–	–
In pain	−9.05	(−11.73 to −6.36)	0.55	(0.37 to 0.80)	0.48	(0.31 to 0.72)
Cognition						
Mild deficit	–	–	–	–	–	–
Severe deficit	−11.26	(−14.51 to −8.00)	0.41	(0.30 to 0.57)	0.61	(0.41 to 0.89)
Speech						
Slurred speech	–	–	–	–	–	–
Can't speak	−9.16	(−12.24 to −6.08)	0.53	(0.37 to 0.75)	0.48	(0.33 to 0.71)
Religious affiliation						
None	–	–	–	–	–	–
Hindu	3.16	(−6.36 to 12.69)	1.33	(0.29 to 6.03)	2.03	(0.61 to 6.80)
Jewish	−0.29	(−7.45 to 6.87)	3.09	(1.03 to 9.25)	1.20	(0.47 to 3.04)
Muslim	−2.22	(−10.5 to 6.04)	2.18	(0.53 to 8.90)	0.79	(0.25 to 2.52)
R. Catholic/E. Orthodox	−2.62	(−9.07 to 3.82)	1.51	(0.48 to 4.73)	1.32	(0.67 to 2.58)
Evangelical Protestant	1.44	(−5.47 to 8.36)	1.90	(0.53 to 6.73)	1.91	(0.69 to 5.33)
Nonevangelical Protestant	−0.90	(−4.99 to 3.19)	1.36	(0.53 to 3.45)	0.99	(0.51 to 1.89)
Other	3.59	(−3.11 to 10.29)	1.50	(0.45 to 5.02)	1.45	(0.65 to 3.25)
Importance of religion						
Not important	–	–	–	–	–	–
Fairly important	2.75	(−1.09 to 6.58)	1.10	(0.61 to 1.97)	1.32	(0.69 to 2.54)
Very important	4.76	(0.45 to 9.06)	1.21	(0.72 to 2.04)	1.49	(0.89 to 2.50)
Most important	9.25	(3.31 to 15.19)	2.48	(1.04 to 5.93)	1.45	(0.69 to 3.06)

OR = odds ratio.

1. Average marginal effect and odds ratio are adjusted for age categories, gender, race/ethnicity, physician specialty, physician graduate school, and region.

2. Generalized linear model and logit model are run with survey data analysis to estimate quality of life rating and recommendations for further care, respectively.

Dashes indicate the referent for each respective category.

appropriate treatment rated quality of life three times higher than those recommending palliative treatment only. Physicians who were more religious tended to rate quality of life higher and recommended full medical treatment.

The association between physician assessment of quality life and recommendations for further care expands prior research in this area (16–18) to characterize physicians on a national level. The present study may also offer an explanation for the

previously observed association between physician-assessed quality of life and the presence of DNR orders (10–13, 17), as quality of life variables in this study significantly influenced subsequent recommendations about life-sustaining treatment. These findings should be considered carefully in light of evidence that physician and patient assessment of quality of life correlate poorly (13, 22–25), with physicians often underestimating patient reported quality of life (16–18, 26). When negotiating medical decisions for critically ill patients, conflicts are frequent (27); such conflicts may be mitigated insofar as physicians become more aware of the limitations of their quality of life assessments and the influence that these assessments have on their recommendations for further care.

Physician recommendations in this study were influenced by four out of five experimental variables—alimentation, pain, cognitive deficits, and speech. As expected, diminished cognition seemed to have the most effect on physicians' judgments about patient quality of life. The latter finding confirms the previously observed strong connection between cognitive status and both perceived low quality of life (14, 16, 18, 28) and use of DNR orders (29, 30). Physicians in our survey rated quality of life 30% lower and were almost half as likely to recommend full medical treatment when the patient had severe cognitive deficits. The magnitude of this effect, however, would likely vary depending upon how the cognitive deficit is described. In practice, physicians should be careful about assuming that patients with severe cognitive deficits necessarily experience their lives as having poor quality. Physicians can, of course ask as even those with severe cognitive deficits often still are able to answer questions about their quality of life (31).

This study also contributes to recent work indicating that highly religious patients pursue and receive more aggressive end-of-life care (32–34), and that physicians of higher religiosity tend to be less willing to withdraw care (35). In our study, physicians who consider religion most important were twice as likely to recommend full medical treatment and rated patient quality of life 30% higher; this was of similar magnitude to the effect of pain. This may be related to beliefs about the sanctity of life (36), the possibility of miracles (37), or deference to a higher power. We hypothesized that religious physicians would be less affected by cognitive deficits because of commitments regarding the sanctity of life, but the data indicate that religious and nonreligious physicians were similarly affected by the cognitive deficits variable.

This study has a number of limitations. Although the response rate to the survey was high (61.6%), nonrespondents may have differed from our sample in ways we cannot measure (38). We used a simple scale to assess quality of life; results may differ from studies where physicians use more advanced metrics. The age of the patient in the vignette was 47 years and was not varied; physicians may appraise elderly patients differently. The survey question on recommendations for further care may also have unintentionally established a dichotomy between "all medically appropriate therapy" and "only palliative (comfort directed) care," when in fact palliative treatment is often the most appropriate medical treatment.

In conclusion, this study indicates that physicians' judgments about quality of life are highly correlated with whether they recommend further life-sustaining treatment or more palliative approaches to care. More religious physicians both rate quality of life higher and recommend more life-sustaining treatment. Physicians and patient family members should consider these tendencies and predispositions when making recommendations and decisions in end-of-life care.

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