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A randomized trial of expanding choice sets to motivate advance directive completion

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Abstract

Background—Evidence suggests that advance directives may improve end-of-life care among seriously ill patients, but improving completion rates remains a challenge.

Objective—This study tested the influence of increasing the number of options for completing an advance directive among seriously ill patients.

Methodology—Outpatients (N=316) receiving hemodialysis across 15 dialysis centers in the Philadelphia region between July 2014 and July 2015 were randomized to receive either the option to complete a brief advance directive form or expanded options including a brief, expanded, or comprehensive form. Patients in both groups could decline to complete an advance directive or take their selected version home. The primary outcome was a returned, completed advance directive. Secondary outcomes included whether patients wanted to complete an advance directive, decision satisfaction, quality of life at 3 months, and patient factors associated with advance directive completion.

Results—Although offering more advance directive options was not significantly associated with increased rates of completion (13.1% in the standard group vs. 12.2% in the expanded group,

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$P=0.80$), it did significantly increase the proportion of patients who wanted to complete an advance directive and took one home (71.9% in standard vs. 85.3% in expanded, $P=0.004$). There was no difference in satisfaction ($P=0.65$) or change in quality of life between groups ($P=0.63$). A higher baseline quality of life was independently associated with advance directive completion ($P=0.006$).

Conclusions and Relevance—These results suggest that although an expanded choice set may initially nudge patients toward completing advance directives without restricting choice, increasing actual completion requires additional interventions that overcome downstream barriers.

Keywords

advance directive; end-of-life; advance care planning; behavioral economics

Introduction

More than two decades after the Patient Self-Determination Act mandated that patients be informed of their right to make advanced decisions regarding their medical care,¹ there remains a critical deficiency of quality advance care planning in the U.S.² This entails the process of making decisions about end-of-life care and ideally includes written documentation of preferences, most often in an advance directive.³ Although just one component of advance care planning, completing an advance directive may help patients avoid unwanted care near the end of life, and may reduce decision-making burdens for loved ones.⁴⁻⁸ However, many believe that advance directives have failed to live up to their promise due to many patient, surrogate, physician, and health system barriers.⁹⁻¹³ The low completion rate of advance directives is one particularly important limitation because it is upstream of most others,¹⁴ and prior efforts to improve completion rates have shown limited benefit.^{10,15,16}

Advance care planning is most germane for patients with serious illnesses, such as those with end-stage renal disease (ESRD) receiving long-term dialysis therapy. Despite a median survival of only 3 years from dialysis initiation,¹⁷ the prevalence of advance directives among patients with ESRD ranges from 22% to 51% depending on the population surveyed and whether distinctions were made between a designated proxy, a living will, or both.¹⁸⁻²² Nearly half of older patients with ESRD are admitted to the intensive care unit in the final month of life,²³ whereas patients with a completed advance directive may be more likely to die at home and with less pain.^{24,25}

Insights stemming from the field of behavioral economics suggest scalable ways to increase advance directive uptake.¹⁴ Specifically, reframing the yes-or-no decision of whether to complete an advance directive by offering multiple alternative responses (e.g., providing several types of ADs to choose from) may nudge a patient toward completing one. Two mechanisms underlie this intrinsic effect on decision making. First, offering additional, related choices reveals the full range of possibilities, thereby influencing people's perceptions of the pros and cons of each option.^{26,27} Second, expanding choice sets creates a seemingly more attractive “middle” or compromise option, thereby harnessing the human tendency of extremeness aversion.²⁶⁻²⁹ Importantly, these influences work by *expanding*

people's choices, and so represent far more ethical approaches to guiding decisions than interventions that restrict choices.^{30,31}

In healthcare, expanded choice sets have been studied in hypothetical situations, such as insurance plan choices and physician prescribing practices,^{32,33} but have not been tested among patients facing real choices. We therefore sought to determine whether offering multiple alternatives for the decision to complete an advance directive influenced completion rates among patients with ESRD. We also evaluated the influence of expanded choice sets on whether patients said they wanted to complete an advance directive, and on their decision satisfaction and quality of life.

Methods

Study Design and participants

We randomly assigned choice sets, differing in the number of advance directives to choose from, to adult outpatients with ESRD receiving hemodialysis for at least 90 days who lacked a prior living will. Patients with impaired vision or cognition, or lacking English proficiency, were deemed ineligible due to their compromised ability to complete study documents.

Patients were recruited from 15 DaVita hemodialysis centers throughout Philadelphia, Pennsylvania and the surrounding region, including southern New Jersey. Potentially eligible patients were identified by medical chart review and approached during a dialysis session by a trained research coordinator (5 in total) using a standardized protocol to ascertain whether they already possessed a valid advance directive. Informed consent was solicited only among patients without an existing living will. The research coordinator described the study, including that patients would be presented with different choices for making a decision about planning for their future care, and answered all questions. Additional details regarding recruitment and enrollment procedures are available in Appendix A of the online supplement.

The Institutional Review Boards of the University of Pennsylvania and DaVita Clinical Research approved this study protocol.

Intervention

The standard choice set form included a dichotomous choice of “yes” or “no.” The expanded form was identical to the standard except that it offered four potential responses: “no” and three “yes” options for different advance directive versions. The living will sections of these three advance directives assessed treatment preferences in each of four (“brief”), six (“expanded”), or eight (“comprehensive”) clinical scenarios. All versions offered additional space for patients to clarify or expand on their preferences. The brief advance directive was used for the standard choice set group. The clinical scenarios described a spectrum of neurologic, cognitive, and physical disabilities along with loss of decision-making capacity. The advance directives used in this study were adapted from the Department of Veterans Affairs and Five Wishes document;³⁴ the latter is the most commonly used advance directive in the U.S. Copies of the choice set forms, and the comprehensive advance directive can be found online in Appendix B and C, respectively.

Group allocation was determined by random electronic number generation, with assignment probabilities of 50% to each group. Research coordinators were blinded to group assignment until after the patient consented to study participation.

After obtaining informed consent, the coordinator read aloud the assigned choice set form, which briefly described the potential benefits of completing an advance directive and asked whether or not the patient wanted to complete an AD using either the standard or expanded response options. Patients were instructed to choose among the options in their assigned choice set. Patients who said they wanted to complete an advance directive were given their requested version to take home, were provided with instructions and materials to mail the completed document to the study team, and received a reminder phone call on days 14 and 21 if it had not been received. An advance directive was considered complete if received within 3 months of enrollment with the legal execution requirements, which vary by state. Pennsylvania statute (§5452) requires two witness signatures. New Jersey (N.J. Stat. Ann. § 26:2H-56) allows for two witness signatures or notarization.

Data collection, measures, and definitions

Patient-reported measures were used to assess demographics, previous EOL discussions, quality of life, and functional status at baseline. Specifically, we used the McGill Quality-of-Life Questionnaire (MQOL) and the 12-Item Short-Form Health Survey (SF-12).³⁵ Both instruments have been validated in patients with ESRD,³⁶⁻³⁸ and the MQOL includes a unique existential subscale³⁹ as well as a single-item scale to measure overall quality of life.^{40,41} These measures were administered again via telephone 3 months after enrollment. Research personnel attempted up to 3 phone calls and one in-person visit during dialysis.

We assessed patient comorbidities via chart review and transplant status using the United Network for Organ Sharing list. Finally, using the language from Wright and colleagues,⁴² we inquired if patients had previously discussed end-of-life care with their physician or family.

Debriefing

After patients returned a completed advance directive, research personnel debriefed them via telephone about the precise differences between the two choice sets and three advance directive versions. If debriefed patients asked to complete a different version, it was mailed to them. During debriefing, patients were offered the opportunity to change any preferences stated in their living wills. Final advance directives were mailed to the patient and their designated surrogate and dialysis center with permission.

Outcomes

The primary outcome was a completed and returned advance directive. Although the intervention specifically targeted patients' motivation to complete an advance directive, we considered an expression of such motivation, defined as an affirmative response in the choice set and taking the advance directive home, as a secondary outcome because actual completion of directives is a more important clinical outcome. Other secondary outcomes included the Satisfaction with Decision score⁴³ measured immediately following patients'

decision using a standard or expanded choice set, and change in quality of life at 3 months. These were intended to capture unintended harm from expanding choices for patients. We also assessed patient characteristics associated with the outcomes of wanting to complete an advance directive and with actually completing one.

Analysis

Our protocol specified primary intention-to-treat analyses among all randomized patients. Data are summarized as number (percent) for categorical data or as mean (standard deviation) or median (interquartile range) for continuous data. Bivariate comparisons are calculated using Chi square or Fisher's exact tests for categorical data, or as two-tailed *t* tests and Wilcoxon rank-sum tests for normally and non-normally distributed continuous data, respectively. Change scores for the MQOL were calculated by subtracting the baseline value from the 3-month value, and analyzed among patients who responded at both time points.

Logistic regression was used to explore the relationship between baseline variables and the primary outcome of completion of an advance directive. The potential patient- and center-level predictors can be found in Appendix B and C. Variables were eligible for model inclusion if their bivariate relationship with the outcome had an association of $P < 0.20$. Additionally, we prospectively specified the following covariates for inclusion in the final model based on known associations with advance directive completion: age,²⁰ race,⁴⁴ and previous end-of-life discussions.^{20,42} We used backward stepwise selection based on likelihood ratio tests to generate the final multivariable model.

To assess the possibility that the length of the advance directive would influence completion rates, we performed two secondary analyses. First, we compared advance directive completion rates only among those patients who chose to take the document home. Second, we compared completion rates among patients in the intervention arm who selected the brief, expanded, or comprehensive directives.

We conducted several other secondary analyses to explore our framework in which advance directive completion may represent the product of (1) the probability of being motivated, or wanting, to complete an advance directive, and (2) the probability of completing an advance directive conditional upon motivation. We hypothesized that the two steps in this pathway may be influenced by different patient factors, and thus explored associations between patient characteristics and each of these outcomes. Finally, to determine if certain patient types were particularly susceptible to nudging by an expanded choice set, we explored potential two-way interactions between assigned choice set and pre-specified patient characteristics on the secondary outcome of wanting to complete an advance directive. All analyses were performed by investigators blinded to group assignment and using Stata v13. (StataCorp, College Station, Texas). A two-sided *P*-value < 0.05 was considered statistically significant.

Based on estimates from previous studies,^{19,20,22} we assumed that 20 percent of patients in the standard choice set group would complete an advance directive. A total sample size of 318 would yield greater than 80% power to detect an absolute 15% difference in the

proportion of patients completing advance directives^{16,45} based on a Chi square test and assuming a 5% attrition rate.

Results

Recruitment, retention, and baseline characteristics

We screened 1,266 patients for eligibility in 15 dialysis centers from July 2014 through July 2015. As shown in the CONSORT diagram (Figure 1), 461 (36.4%) patients were deemed ineligible, and eligibility was indeterminate for 218 (17.1%) patients who were absent or sleeping. Of the 587 (46.4%) fully eligible patients, 321 (54.7%) consented to participate. Following randomization, 2 patients in the standard choice set (“standard”) group and 3 patients in the expanded choice set (“expanded”) group were deemed ineligible, leaving 160 and 156 patients in these arms, respectively, for inclusion in intention-to-treat analyses.

For the 3-month follow-up, 127 (78.4%) patients in the standard group and 129 (81.1%) patients in the expanded group completed the MQOL and SF-12 questionnaires. The only patient or center characteristic that differed between 3-month responders and non-responders was that non-responders had a lower baseline quality of life score (mean: 6.4; standard deviation: 2.4 vs. mean: 7.1; standard deviation: 2.2; $P=0.04$).

Among the 15 centers, 55.4% were academically affiliated, 69.6% were in an urban area, and the median patient census was 88 (range 24-164). Table 1 displays baseline patient characteristics, which were comparable across the study groups with the exception of religiosity. There were no differences at baseline between the groups in self-reported quality of life, functional status, or previous end-of-life discussions. Overall, 42.7% of patients reported having had an end-of-life discussion with their family and 13.6% with their physician.

Primary outcome—Completed advance directives were returned by 40 (12.7%) of the 316 eligible randomized patients. There was no difference in completion rates between the groups (13.1% [95% Confidence Interval (CI): 8.3-19.3%] in the standard vs. 12.2% [95% CI: 7.5-18.4%] in the expanded, $P=0.80$) in the intention-to-treat analysis (Figure 2). Completion rates did not differ across research coordinators ($P=0.59$). Among only those who wanted to complete an advance directive and took one home, there was also no difference in completion rates (standard group 21/115 (18.3%) [95% CI: 11.7-26.5%] vs expanded group 19/133 (14.3%) [95% CI: 8.8-21.4%], $P=0.40$).

Upon debriefing, 4 of the 21 patients in the standard group who completed an advance directive (brief version per protocol) and 2 of the 8 patients in the expanded group who completed a brief advance directive asked to complete a new, comprehensive version. None of the 11 patients in the expanded group who completed a longer advance directive version chose a shorter one after debriefing.

In bivariate analyses, gender, SF-12 mental component summary, MQOL single-item score, and MQOL-existential score were significantly associated with advance directive completion (Appendix D). However, in the final model adjusted for age, race, and previous end-of-life

discussions, only a higher quality of life score remained significant (odds ratio: 1.30 for 1 unit increase; 95% CI: 1.08-1.55; $P=0.006$) (Table 2).

Secondary outcomes—More patients assigned to the expanded group wanted to complete an advance directive and took home their chosen version than in the standard group (133 (85.3%) vs. 115 (71.9%); $P=0.004$) (Figure 2). These rates were similar across the different research coordinators ($P=0.08$). Among patients in the expanded choice set group who wanted to complete an advance directive, the length of the version did not influence completion rates ($P=0.57$).

Patient and clinic characteristics were not predictive of which patients wanted to complete an advance directive (Appendix E). Additionally, patient characteristics did not modify the effect of an expanded choice set on whether they wanted to complete an advance directive (Appendix F).

Patients were highly satisfied with the decision process as shown by the overall mean satisfaction score of 4.28 (standard deviation 0.78), and there were no differences between the standard and expanded groups (4.25 vs. 4.30, $P=0.65$) (Figure 3).

Among patients who wanted to complete an advance directive, those who had prior end-of-life discussions (odds ratio: 2.48; 95% CI: 1.20-5.13; $P=0.02$), who were white (odds ratio: 2.67; 95% CI: 1.03-6.88; $P=0.04$), or who had a higher quality of life score (odds ratio for 1 unit increase: 1.36; 95% CI: 1.12-1.66. $p=0.002$) were more likely to do so (Table 2).

Follow-up—Changes over time in quality of life and functional status were neither statistically nor clinically significant,⁴⁶ and did not differ between the standard and expanded choice set groups, as shown in Appendix G and H.

Discussion

Given the potential benefits of completing advance directives, but low rates of completion among seriously ill patients, we tested whether a scalable intervention informed by behavioral economic principles could increase advance directive completion rates among ESRD patients receiving dialysis. The intervention – expanding the number of advance directive options – was based on prior evidence in other settings that offering multiple alternative options can increase the proportion of respondents who choose some affirmative option.^{26,29} In keeping with this hypothesis, this randomized trial found that an expanded choice set increased the proportion of seriously ill patients who said they wanted to complete an advance directive. However, it did not affect the downstream process of actually completing the advance directive.

The large discordance between the proportions of patients who wanted to complete an advance directive and those who actually did has several potential explanations. First, patients may have completed an advance directive but forgotten or chosen not to return it to the study team. We verbally encouraged patients to return their advance directive, and offered to distribute it to their healthcare agents and dialysis center, but these prompts may

have been insufficiently compelling. To surmount this barrier, future work might use new web-based platforms for advance directive completion such as www.OurDirectives.org.

Second, many barriers prevent patients from following through on intentions to complete an advance directive, including cognitive biases such as over-optimism, their uncertainty regarding prognoses, legal requirements for signatures or notarizations, and the time and emotional costs required to contemplate one's mortality and complete the documents.^{14,47-50} Specifically in this study, it is plausible that the lengthier comprehensive advance directive reduced some patients' motivation to actually complete it. Although the rates of returned advance directives did not differ by directive length in the intervention cohort, this highlights existing uncertainty regarding the optimal content and amount of information that an advance directive should contain.

Third, in this behavioral intervention study, there was potential for unintended and unmeasured biases during recruitment and enrollment. For example, people tend to provide affirmative answers to items in a questionnaire regardless of the content of the items (i.e., the "acquiescence effect").^{51,52} Likewise, the research coordinator's script described the potential benefits of completing an advance directive, which may have led to a social desirability bias. However, prior work suggests that these effects tend to account for only small discordances between stated preferences and actions.^{51,53} Finally, despite having the trained research coordinators use a standardized, highly scripted recruitment protocol, they may have preferentially attended to the patients assigned the expanded choice set.

Fourth, by excluding patients who had already completed an advance directive, this study intentionally targeted patients who may have the greatest barriers to completing one. The observation that enrolled patients reported low rates of end-of-life discussions with their physicians further supports the notion that we enrolled a particularly difficult-to-reach cohort.

Finally, although the advance directive completion rates in this trial were similar to in previous trials among medical patients,^{45,54,55} expanding choice sets simply may not have been a sufficient nudge for this often difficult task. Indeed, one systematic review found that the more intensive the intervention (i.e., requiring increased patient-physician communication) the greater the effect on advance directive completion rates.⁵⁴ We sought to test a less resource-intensive, more scalable approach due to well-recognized limitations on physicians' time and understanding.^{56,57} However, at least in this case, the virtue of scalability may have been offset by lower efficacy.

Regardless of the explanations for this discordance, it seems clear that expanding choice sets helps motivate advance directive completion, but by surmounting only one of the many barriers to ultimate completion, is itself insufficient. Future interventions need to focus on providing additional resources to facilitate this burdensome process for patients. Such interventions may include making a notary available to do home visits for motivated patients, providing incentives for actual advance directive completion after patients indicate willingness, or loosening requirements that directives be signed by witnesses or notaries, which is of questionable clinical importance.⁵⁸

A second important finding of this study is that patients' satisfaction with their decision to take an advance directive home for completion was high in both choice set groups. The fact that expanding choice sets did not reduce decisional satisfaction is important because previous studies have suggested that offering too many choices may increase decision difficulty and demotivate decision-making.^{32,33,59} Although we did not assess patients' satisfaction with their downstream decision of whether or not to actually complete the advance directive that they took home, other factors beyond the initial choice set may have influenced such evaluations.

Finally, although all patient types similarly wanted to complete an advance directive, white patients with higher quality of life and who had prior end-of-life discussions were more likely to actually do so. These findings are consistent with previous literature,^{20,42,44,60} and highlight the impact that end-of-life care discussions have on patient engagement in advance care planning. Moreover, this finding suggests the possibility that future interventions to increase advance directive completion need to be tailored for patients with unique barriers to doing so.

These results should be interpreted in light of several limitations. The objective of this study was to test the impact of an expanded choice set on actual advance directive completion. Thus, we required patients to return their advance directives to investigators to ensure internally valid outcome assessment, which created the potential for missed outcomes from patients who completed the document but did not return it. Thus, our data may underestimate true rates of advance directive completion, albeit equally across study groups.

Second, the enrollment of patients with ESRD receiving in-center hemodialysis may limit generalizability to patients receiving other modes of dialysis or to patients with other serious chronic illnesses. For purposes of testing a novel intervention to augment advance care planning, a homogenous population in regards to disease severity (i.e., all require chronic, life-sustaining dialysis therapy) is ideal.

Third, we did not randomly assign the ordering of options within the choice sets but rather listed "yes, a brief AD" first and "no" last in each choice set. Because the first-listed option tends to be more often selected than the subsequent ones,⁶¹ this may overestimate the proportions of patients who selected the option to complete a brief advance directive in both groups, but should not bias the comparisons of proportions of patients between groups who want to complete and do complete an AD.

This trial has several strengths. First, it represents the first randomized trial to employ the novel and simple behavioral economic intervention of expanding choice sets in a real clinical setting. Second, it is the only randomized trial we are aware of to test a behavioral intervention to increase advance directive completion among patients with ESRD, who experience substantial morbidity and mortality and have previously been underrepresented in advance care planning trials. Third, patient retention through three months after enrollment was excellent, minimizing bias in comparisons of changes in quality of life over time. Finally, our trial was designed to test potential unintended consequences of using nudges to change people's health decisions.⁶² Despite concerns about this practice, we found that

expanding choice sets in a high-stakes context did not degrade patients' decisional satisfaction or quality of life. Further, there were no types of patients examined that appeared to be disproportionately susceptible to the influence of this nudge.

Conclusions

Simply offering more options for advance directive completion to seriously ill patients may help overcome an initial important barrier to completion – namely, the lack of motivation to do it. However, initial engagement is insufficient for the majority of patients who face multiple downstream barriers to completing this important document. Behavioral interventions that only target one of several sequential hurdles in this often difficult and cumbersome process may not suffice. This trial highlights the need for scalable interventions that also actively facilitate advance directive completion for motivated patients. Thus, future research should consider whether expanding patients' options for the modality of completion (e.g., in person, by mail, or online) or making the content of directives more germane to patients' goals would augment completion.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Recruitment, enrollment, retention, and data collection.

a Patients were sleeping or absent for a minimum of 2 dialysis sessions.

b The research coordinator telephoned patients up to 3 times and attempted 1 in-person visit at the dialysis center.

Figure 2.

Percentage of patients who wanted to complete versus actually completed an advance directive (AD) by choice set (intention-to-treat analysis). Comparisons were made using Chi square test of proportions of the totals for each outcome by choice set.

Figure 3.

Satisfaction with the decision to complete an advance directive by choice set. Comparison was made using Wilcoxon rank-sum test.

^a The Satisfaction with Decision instrument is a 6-item scale that has been validated to measure satisfaction with a healthcare decision and predict behavioral intention immediately after decision making.

Table 1

Characteristics of Dialysis Patients in the Study to Assess the Effect of an Expanded Choice Set on Advance Directive Completion

Characteristic	Total Sample (N = 316)	Standard Choice Set (n = 160)	Expanded Choice Set (n = 156)
Demographics			
Age, $\bar{x}$ (s), years	56.7 (13.4)	55.3 (14.6)	58.1 (11.9)
Male	187 (59.2)	103 (64.4)	84 (53.9)
Black or African American	239 (77.4)	119 (75.8)	120 (79.0)
Married or partnered	95 (30.1)	51 (31.9)	44 (28.2)
Education 12 years	173 (55.5)	91 (57.6)	82 (53.3)
Annual income \$30,000	165 (60.4)	79 (57.7)	86 (63.2)
Months on dialysis, median (IQR)	37.2 (17.3–71.6)	35.3 (16.9–69.9)	42.9 (18.5–72.2)
Christian ^a	255 (82.8)	119 (76.3)	136 (89.5)
Medical history			
Heart disease	141 (44.6)	67 (41.9)	74 (47.4)
Malignancy	28 (8.9)	16 (10.0)	12 (7.7)
Depression	26 (8.2)	11 (6.9)	15 (9.6)
Actively listed for transplant	84(26.6)	45 (28.1)	39 (25.0)
Previous EOL discussions			
With physician	43 (13.6)	20 (12.5)	23 (14.7)
With family	135 (42.7)	66 (41.3)	69 (44.2)
Baseline surveys, $\bar{x}$ (s)			
MQOL total	7.5 (1.7)	7.5 (1.6)	7.4 (1.8)
MQOL-existential	7.8 (1.9)	7.8 (1.8)	7.7 (2.0)
MQOL–single item	7.0 (2.3)	6.9 (2.3)	7.1 (2.2)
SF-12 PCS	39.6 (9.8)	40.0 (9.5)	39.1 (10.1)
SF-12 MCS	50.0 (10.1)	50.5 (10.0)	49.6 (10.1)

Note: Values are listed as number (percentage) except where otherwise noted, s = standard deviation; IQR = interquartile range; EOL = end-of-life; MQOL = McGill Quality-of-Life Questionnaire; SF-12 = 12-Item Short-Form Health Survey; PCS = physical component summary; MCS = mental component summary. Continuous variables are reported as $\bar{x}$ (s) or median (IQR); categorical variables are reported as number (percentage) of patients.

^a $P = 0.002$; all other characteristics showed nonsignificant differences with $P > 0.05$.

Table 2

Final Multivariable Model for Advance Directive Outcomes

Characteristic	Total Cohort (<i>n</i> = 297) ^a				Wanted to Cohort (<i>n</i> = 231) ^a			
	Wanted to Complete an Advance Directive		Advance Directive Completed		Advance Directive Completed		Advance Directive Completed	
	Odds Ratio (95% CI)	<i>P</i>	Odds Ratio (95% CI)	<i>P</i>	Odds Ratio (95% CI)	<i>P</i>	Odds Ratio (95% CI)	<i>P</i>
Age	1.00 (0.98–1.02)	0.83	1.01 (0.99–1.04)	0.34	1.02 (0.99–1.05)	0.26		
White	0.92 (0.42–2.01)	0.84	2.21 (0.91–5.35)	0.08	2.67 (1.03–6.88)	0.04		
Any previous EOL discussion ^b	0.92 (0.53–1.60)	0.78	2.00 (0.99–4.04)	0.06	2.48 (1.20–5.13)	0.02		
MQOL–single item scale ^c	—	—	1.30 (1.08–1.55)	0.006	1.36 (1.12–1.66)	0.002		

Note: CI = confidence interval; EOL = end of life; MQOL = McGill Quality-of-Life Questionnaire.

^a Analytic sample included patients with complete data (total cohort 297/316 = 94.0%; wanted to cohort 231/248 = 93.1%).

^b With physician or family.

^c MQOL–single item scale did not meet prespecified criteria for inclusion in the multivariable model with outcome of wanting to complete an advance directive.