Are Demographic Characteristics Associated with Advance Directive Completion? A Secondary Analysis of Two Randomized Trials

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INTRODUCTION

Preferences for future medical treatments may be documented in a legal document known as an advance directive (AD). Despite national efforts to promote AD completion,¹ men, blacks, and those with less education less frequently complete ADs.^{2,3} However, it remains unclear whether such groups differ in their *willingness* to complete ADs or have different *opportunities* to do so. The latter would suggest disparities in access to advance care planning. We sought to elucidate this key distinction by assessing associations between demographic characteristics and AD completion within two randomized controlled trials (RCTs) that presented uniform opportunities to participants who may be targeted for AD completion.

METHODS AND FINDINGS

We performed secondary analyses of data from two RCTs (NCT02289105 and NCT02017548). RCT 1 compared three ADs that differed in how information was presented to 484 people with serious illnesses enrolled from 30 clinics within two Pennsylvania health systems between February 2014 and March 2016.⁴ The study protocol for trial 1 has been published

Table 1 Characteristics of Enrolled Participants in Two Randomized Trials Supporting Advance Directive Completion

Characteristic	Trial 1	Trial 2
	Seriously ill patients	New health system employees
Number enrolled	484	1279
Age in years (median, interquartile range)	63 (56.0–69.5)	29 (25.0–38.0)
Sex		
Female	212 (44.0%)	918 (71.8%)
Male	270 (56.0%)	333 (26.0%)

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Table 1. (continued)

Characteristic	Trial 1	Trial 2
	Seriously ill patients	New health system employees
Other/prefer not to answer	–	28 (2.2%)
Race		
White	337 (69.6%)	678 (53.0%)
Black	123 (25.4%)	344 (26.9%)
Mixed or Other	24 (5.0%)	197 (15.4%)
Prefer not to answer	–	60 (4.7%)
Highest level of education completed		
High school or less	172 (35.5%)	108 (8.4%)
Some college	111 (23.2%)	269 (21.0%)
College degree	116 (24.3%)	602 (47.1%)
Post-college degree	79 (16.5%)	224 (17.5%)
Missing	–	76 (5.9%)
Religious affiliation		
Catholic	165 (34.1%)	Not asked
Protestant	173 (35.7%)	
Other Christian	48 (9.9%)	
Other	98 (20.3%)	
Marital status		
Currently married	309 (64.4%)	Not asked
Never married	68 (14.2%)	
Divorced	60 (12.5%)	
Separated	13 (2.7%)	
Widowed	30 (6.3%)	
Household income (annual)		
Less than \$30,000	129 (26.7%)	Not asked
\$30,000–\$9,999	135 (27.9%)	
\$60,000–\$89,999	92 (19.0%)	
\$90,000 or more	128 (26.5%)	
Primary diagnosis		
Chronic obstructive pulmonary disease	23 (4.8%)	Not applicable
Other incurable lung disease	21 (4.3%)	
Gastrointestinal cancer	99 (20.5%)	
Genitourinary cancer	90 (18.6%)	
Breast cancer	29 (6.0%)	
Pancreatic or gallbladder cancer	59 (12.2%)	
End-stage renal disease	35 (7.2%)	
Heart failure	11 (2.3%)	
Amyotrophic lateral sclerosis	38 (7.9%)	
Lung cancer	79 (16.3%)	
Prior clinical degree*	Not asked	269 (21.0%)
Type of employment		
Full-time	Not applicable	933 (73.0%)
Part-time		346 (27.1%)

*Participants were considered to have clinical degrees if they had any of the following designations: MD, MSN, BSN, RN, LPN, DO, NP, PA, DPT, PharmD, DVM, CRNA, speech pathology, CNA, CMA, surgical tech, medical assistant, nurse assistant, or medical technologist

A Seriously ill patients **B Health system employees**

Figure 1 Characteristics of participants as predictors of advance directive completion. CI = confidence interval. Characteristics entered in fully adjusted logistic regression with randomization arm (and recruiter for RCT 1) entered as fixed effect.

elsewhere.⁴ RCT 2 compared methods of encouraging AD completion among new employees at a Pennsylvania healthcare system between November 2014 and August 2015. An AD completion module was inserted into the online system through which all new healthcare system employees complete employment documents. Employees were randomly assigned a module that either did or did not require them to make an active choice of whether to complete an AD.

Participants in each trial received standardized educational materials and a professionally endorsed AD form on which they could indicate preferences for five life-sustaining interventions and a general treatment goal. Institutional review boards approved all procedures.

The primary outcome in these secondary analyses was AD completion, defined as patients returning an AD via mail in RCT 1 and employees completing an AD online in RCT 2. Independent variables were all demographics measured in each trial (Table 1). Each trial was independently analyzed.

We used multivariable logistic regression to examine associations between demographics and AD completion. Randomization arm was entered as a fixed effect in analyses of both RCTs, and recruiter was an additional fixed effect for RCT 1.

RESULTS

Characteristics of participants in each RCT are reported in Table 1. In RCT 1, 286 of 484 seriously ill outpatients (59.1%) completed an AD. In multivariable analyses, none of the measured patient characteristics (age, sex, race, marital status, income, level of education, religious affiliation, and primary diagnosis) were associated with AD completion (all $p > 0.10$; Fig. 1a).

In RCT 2, 355 of the 1279 participating employees (27.8%) completed an AD. In fully adjusted models, participants who were black (OR = 1.51; 95% CI = 1.09–2.09) or of mixed/other race (OR = 1.91; 95% CI = 1.33–2.76) were significantly more likely than white participants to complete an AD (Fig. 1b). Part-time employees were less likely than full-time employees to complete ADs (OR = 0.66; 95% CI = 0.48–0.89). No other characteristic was significantly associated with AD completion (all $p > 0.05$).

DISCUSSION

This study shows that when all individuals are given the same opportunities to complete ADs, demographic characteristics are not consistently associated with AD completion. Because results from previous observational studies—which found that men, blacks, and less-educated persons completed ADs less frequently—were not observed when equal opportunities to complete ADs were ensured, those prior studies were likely identifying disparities in patients' access to such opportunities

rather than differences in patients' willingness to complete ADs.

The findings of this study may not generalize beyond the populations studied. RCT 1 participants agreed to participate in a study of ADs, perhaps creating a motivated cohort. The employees in RCT 2 were younger and may approach ADs differently from the general public. However, both patients and healthy individuals have been targeted for AD efforts. We cannot draw conclusions about unmeasured participant characteristics. Finally, we cannot rule out the possibility that the lack of observed associations stemmed from insufficient power, but the point estimates of most of the effects argue against this possibility.

Our findings suggest that future work should seek to mitigate system- or clinician-based barriers to offering opportunities for AD completion equally, rather than focusing solely on different demographic groups' preferences for completing ADs. By providing equal opportunities for AD completion to all patients, such efforts may also reduce demographic differences in the intensity of end-of-life care that patients receive.⁵

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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