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The Effect of Emotion and Physician Communication Behaviors on Surrogates' Life-Sustaining Treatment Decisions: A Randomized Simulation Experiment

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Abstract

Objective—Surrogate decision makers for critically ill patients experience strong negative emotional states. Emotions influence risk perception, risk preferences, and decision making. We sought to explore the effect of emotional state and physician communication behaviors on surrogates' life-sustaining treatment (LST) decisions.

Design—5×2 between-subject randomized factorial experiment.

Setting—Web-based simulated interactive video meeting with an intensivist to discuss code status.

Subjects—Community-based participants 35 and older who self-identified as the surrogate for a parent or spouse recruited from 8 US cities through public advertisements.

Interventions—Block random assignment to emotion arousal manipulation and each of 4 physician communication behaviors.

Measurements and Main Results—Surrogate's code status decision (CPR vs. DNR/AND). 256/373 (69%) respondents logged-in and were randomized: average age 50, 70% were surrogates for a parent, 63.5% were women, 76% were white, 11% black, and 9% Asian, and 81% were college educated. When asked about code status, 56% chose CPR. The emotion arousal manipulation increased depression-dejection ($\beta=1.76$ [0.58 – 2.94]), but did not influence CPR choice. Physician emotion handling and framing the decision as the patient's rather than the surrogate's did not influence CPR choice. Framing no CPR as the default rather than CPR resulted in fewer surrogates choosing CPR (48% vs. 64%, OR=0.52 [0.32-0.87]), as did framing the alternative to CPR as "allow natural death" rather than DNR (49% vs. 61%, OR=0.58 [95% CI 0.35-0.96]).

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AUTHORSHIP ROLE

Dr. Barnato obtained funding, Dr. Barnato and Arnold contributed to study design; Dr. Barnato collected and analyzed the data and takes full responsibility for its scientific integrity; Drs. Barnato and Arnold contributed to writing, critical review, and approval of the manuscript for submission.

POTENTIAL CONFLICT OF INTEREST

None of the authors have financial conflicts of interest with the material herein.

Conclusions—Experimentally-induced emotional state did not influence code status decisions, although small changes in physician communication behaviors substantially influenced this decision.

Keywords

terminal care; cardiopulmonary resuscitation; surrogate; decision making; ethics; communication

Family members play a significant role in determining the kind of care that their loved ones receive at the end of life, acting as surrogate decision makers (“surrogates”) when the patients are incapacitated. For the rare patient who has a written living will¹, the spouse or adult child must interpret its meaning and applicability.² However, even in the absence of such a designation, physicians tend to consult the patient’s family about end-of-life decisions.³

Surrogates experience strong negative emotional states, including fear, anxiety, and depression^{3,4}. Emotional state, whether naturally occurring or experimentally-induced, has been shown to influence risk perceptions, risk preferences, and decision making.⁵⁻⁸ Little is known about the relationship between surrogate emotion and decision making. Surrogate’s emotional state may influence decision making directly by evoking specific tendencies toward action⁹ and appraisal^{5,10}, or indirectly by interfering with their ability to retain and process information, thereby impacting comprehension. Several best practice physician communication skills aim to reduce negative emotional states during family meetings, such as attending to surrogate emotion, avoiding framing palliative treatment alternatives as “doing nothing”, and framing treatment decisions as the patient’s, not the surrogate’s. It is unknown whether these communication behaviors actually influence surrogate emotional state or decision making.

The purpose of the current study was to explore, in a randomized, controlled simulation experiment, the effect of surrogate emotion and physician communication strategies on surrogate code status decisions for an incapacitated spouse or parent. We hypothesized that emotional arousal would increase CPR choice and that physician communication behaviors designed to reduce emotional arousal would decrease CPR choice.

MATERIALS AND METHODS

We conducted a 5×2 between-subject randomized factorial experiment, administered via the web, to assess the relationship between emotional arousal and 4 physician communication behaviors on surrogate code status decision. The surrogate was asked to consider the hypothetical scenario in which their spouse or parent has been admitted to the intensive care unit and is receiving life-sustaining treatment (LST) for pneumonia, severe sepsis, and acute lung injury. During an interactive video meeting with an intensivist, played by an actor, the surrogate asks questions and receives information about the patient’s medical condition, prognosis, and treatment plan. At the close of the meeting, the intensivist discloses a 10% likelihood of survival to discharge in the event of cardiac arrest requiring CPR and asks the surrogate to decide the patient’s code status. Upon completion, we invited the surrogate to send an e-mail to their spouse/parent with an embedded link asking the spouse/parent whether they would prefer CPR or no CPR in the event they were faced with medical scenario themselves. The full instrument can be accessed in an online appendix (See Appendix).

Subjects

We recruited community participants 35 and older who self-identified as the surrogate decision maker for a spouse or parent using advertisements on buses, in hospitals and community centers in Pittsburgh, delivered to University of Pittsburgh and Carnegie Mellon University research registries, and posted under “community > volunteers” on Craig’s list in 8 US cities (Pittsburgh, Boston, New York, Atlanta, Denver, Dallas, Los Angeles, and San Francisco). Eligible subjects included those who had a digital photo of their spouse or parent and access to the internet. Enrolled subjects received a password to access the web-based survey and a \$25 debit card by mail upon study completion.

Experimental conditions

Upon logging-in, subjects identified their relationship to the spouse/parent for whom they would be making hypothetical decisions, then uploaded a digital photo of that person.

Emotion Arousal—Surrogates randomized to the emotion arousal (“hot”) condition saw the relative’s photo and completed two 30-second imagery exercises designed to create a state of emotional attachment.¹¹ Those randomized to the control (“cold”) condition saw instead a photo of a park and completed two short imagery exercises with no affective content.

Physician Communication Behaviors—Surrogates randomized to the emotion-attending condition heard multiple physician statements during the meeting corresponding to the NURSE mnemonic (naming, understanding, respecting, supporting, and exploring emotion)¹² and one “I wish” statement¹²; control condition surrogates heard the identical physician script without these statements. At the end of the family meeting, when the physician ascertained the patient’s code status, we embedded 3 framing manipulations hypothesized to decrease emotional arousal when not choosing CPR (Table 1). Specifically, 1) implying the social norm was not to choose CPR (vs. to choose CPR); 2) indicating the decision was the patient’s (vs. the surrogate’s); and 3) describing the alternative to CPR as “allow natural death (AND)” (vs. “do not resuscitate (DNR)).”

Randomization

We embedded a randomization table into the web-based survey to assign 8 surrogates to each of the 32 combinations in equal blocks and we closed survey access after successfully randomizing 256 subjects.

Measures

The primary outcome measure was the surrogate’s code status decision (CPR vs. DNR/AND). Secondary outcomes included surrogate short form profile of mood states (POMS) directly after CPR decision¹³, the O’Connor decisional conflict scale (DCS)¹⁴, confidence that the surrogate’s decision was consistent with what their spouse/parent would have wanted, and concordance between the surrogate’s decision and what the spouse/parent would have chosen for themselves. Covariates collected included the age of the spouse/parent, whether the spouse/parent had been hospitalized in the last year and the surrogate’s perception of the spouse’s/parent’s health status (excellent, very good, good, fair, poor), surrogate age, sex, race, ethnicity, religion, trust in medical profession scale¹⁵, and prior experience with relatives in the ICU.

Statistical analyses

We tested the balance of surrogate and spouse/parent covariates using the t-test and chi-square test as appropriate. We classified the distribution of continuous variables and

dichotomized or categorized as appropriate. We then tested the association between each of the 5 experimental conditions, after checking for between-condition interactions, and the primary and secondary outcomes using logistic regression (CPR choice, POMS anger-hostility, concordance), ordinal regression (DCS, confidence), and linear regression (POMS tension-anxiety, depression-dejection, confusion-bewilderment) with a base model, a model including imbalanced covariates (if any), and a model including any covariates significantly associated with the outcome in bivariable comparisons at $p < 0.1$).

Human subjects and role of the sponsor

The University of Pittsburgh and Carnegie Mellon University institutional review boards reviewed and approved the research study as meeting exemption 2 for written informed consent. The National Institutes of Health, which funded the study, had no role in the design, execution, or analysis of the study or in the decision to seek publication.

RESULTS

Subjects

Among 428 people who responded to the advertisement, 373 met eligibility criteria. The most common reason for ineligibility were not having a digital photo of the family member and not having a computer. We provided passwords by e-mail to these 373 subjects, 256 of whom (69%) logged on to the survey and were randomized (after which the website closed). Of these, 252 (98%) completed the survey, with a median completion time of 25 minutes. There were no differences between those who logged on and those who did not with respect to age, sex, race, ethnicity, or relationship to the person for whom they would be a surrogate decision maker (data not shown).

The average surrogate age was 50, 63.5% were women, 75.8% were white, 11% black, and 9% Asian, and 81% were college educated. Most (81%) had experience with a relative in the ICU, and 33.3% had a relative who died in the ICU (Table 2). Parents (69.9%) made up the majority of patients for whom the surrogates expected to make medical decisions, many (36.7%) of whom had been hospitalized in the last year.

Except for age in the emotion arousal manipulation condition (48 vs. 52 years, $p=0.025$), the randomization procedure resulted in an equal distribution of measured characteristics between arms for all 5 experimental conditions (data not shown).

Decision Outcomes

Just over half (56%) of surrogates chose CPR. For mood states scored on a scale of 0-20, the mean (SD) scores for tension-anxiety was 10.3 (5.7), for depression-dejection was 8.3 (4.8), and for confusion-bewilderment was 5.1 (4.0); the median (IQR) score for anger-hostility was 1 (0-4). Few (13%) reported high decisional conflict. Most (84%) were “very confident” or “confident” that the choice they made was consistent with what their spouse/parent would want for themselves. Those who were confident were more likely to send an email to their relative ($p<0.001$), and there was decision concordance in 57/73 (78%) of responding relatives.

Experimental Conditions and Decision Outcomes

Those randomized to emotion arousal had higher scores on the depression-dejection scale ($\beta=1.76$ [0.58 – 2.94]), suggesting that the experimental manipulation influenced affective state. However, it did not impact CPR choice. Attending to emotion and framing the decision as the patient’s rather than the surrogate’s also did not impact CPR choice (Table 3). Framing the social norm as not choosing, rather than choosing, CPR resulted in fewer

surrogates choosing CPR (48% vs. 64%, OR=0.52 [0.32-0.87]), as did framing the alternative to CPR as “allow natural death” rather than “do not resuscitate” (49% vs. 61%, OR=0.58 [95% CI 0.35-0.96]).

Surrogates who were randomized to emotion arousal were more confident in their code status decision if the physician attended to emotion than if he didn't (OR=0.45, $p = 0.036$). None of the experimental conditions impacted decisional conflict or concordance (data not shown).

DISCUSSION

In this convenience sample of surrogates from 8 US cities, 56% chose CPR when faced with a hypothetical code status decision for a spouse or parent in the ICU with multisystem organ failure. The experimentally-induced negative emotion, and two physician communication behaviors – attending to emotion (vs. not) and framing the decision as the patient's (vs. the surrogate's) – did not affect CPR choice. On the other hand, framing the social norm as not choosing CPR (vs. choosing CPR) and framing the alternative to CPR as “allow natural death” (vs. DNR) reduced CPR choice.

This is the first study of its kind to experimentally test the role of affect, physician communication, and surrogate decision making. Surrogate decision making is burdensome¹⁶⁻²⁰ and has adverse mental health consequences, including post-traumatic stress disorder (PTSD), anxiety, depression, and complicated grief.^{4,21-31} Literature from the basic judgment and decision psychology literature would predict that surrogates experiencing these emotional states would be more risk averse^{5,10} and therefore may be less likely to agree to forgo LST. Overall, surrogates had moderate tension-anxiety and depression-dejection after the simulated family meeting. However, the emotion manipulation only differentially increased depression-dejection, and it did not influence CPR choice. It is unlikely that emotional state does not actually influence surrogate LST decision making. More likely, our negative finding reflects an insufficient experimental manipulation.

Contrary to our expectations, physician attention to emotion during the family meeting did not influence emotional state or CPR decision. Emotion handling builds trust³² and potentially diffuses negative emotions. Of interest, attention to emotion improved confidence in the CPR decision among subjects randomized to emotion arousal, although it did not also reduce decision conflict. One explanation for the negative findings may be that the attention to emotion was non-specific; the intensivist used scripted statements, rather than responding to emotion demonstrated by the surrogate subject (i.e., empathy). Another is that the study was insufficiently powered to detect smaller absolute differences in CPR choice.

As with emotional influences, framing effects are particularly robust for decisions involving risk or uncertainty.³³ People are reliably found to be risk averse when gambles are framed in terms of gains, and risk seeking when equivalent gambles are framed in terms of losses. One of the ways framing may affect decisions is by influencing the decision maker's emotional response to the decision. Some support to this hypothesis is found in studies suggesting that framing effects may result from differential activation in the emotional centers of the brain.³⁴ Framing the decision as the patient's, not the surrogate's, is intended to remind the surrogate that they are acting as an informant, rather than relaying their own preferences³⁵, and to reduce feelings of responsibility for the decision. Although the normative communication literature would suggest asking “Would your mother want us to do CPR?” instead of “Do you want us to do CPR on your mother” may reduce surrogate distress from

participation in LST decision making and improve substituted judgment (e.g., concordance), we find no evidence for such an effect in this experimental study. In contrast, we found large framing effects based on how CPR and its alternative were described by the physician. When the physician prefaces his question about the CPR decision with “in my experience, most people don’t want CPR,” the surrogate was less likely to choose CPR than when he says “in my experience, most people want CPR.” This finding is consistent with recent research regarding adjuvant chemotherapy choices for breast cancer demonstrating strong influence of descriptive norms on hypothetical treatment choices.³⁶ When the physician describes the alternative to CPR as to “allow natural death” surrogates were less likely to choose CPR than when he describes the alternative as “do not resuscitate.” Although some argue that “allow natural death” results in a less negative emotional response than DNR³⁷, we did not find evidence to support this. However, we provide the first empiric evidence that this phrase, which has been integrated into the language of several health systems,³⁸ may directly influence code status decisions.

The strengths of this study are its randomized design and use of an interactive web-based simulated family meeting rather than a narrative vignette typically used for studies of surrogate decision making.³⁸ The generalizability of the experimental findings is limited by selection biases introduced by a non-random convenience sample of highly-educated respondents and systematic non-response for the concordance outcome.

The relevance of our findings to real clinical practice are unknown. It is unlikely that the emotion manipulation or the simulated family meeting could reliably reproduce the kind of emotional arousal experienced by real surrogates faced with life-sustaining treatment decisions for a critically ill spouse or parent. And we cannot assume that subjects’ hypothetical decisions align with those they would make in real life. As such, our findings cannot be interpreted as evidence against the value of attending to emotion and framing decisions as the patient’s, rather than the surrogate’s which have strong empiric^{32,39} and normative^{12,32,40} value. Nonetheless, findings from this experiment are provocative. Future research might explore the influence of descriptive norms and replacing “do not resuscitate” with “allow natural death” on real CPR choices in situations of low anticipated benefit. Although such manipulations might be ethically controversial, they are certainly less paternalistic than not offering CPR.⁴¹

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Physician communication behavior experimental conditions during the ascertainment of code status

Default: CPR	Default: no CPR
Doctor: People have different thoughts on this, but in my experience, most people want CPR	Doctor: People have different thoughts on this, but in my experience, most people don't want CPR.
Frame: surrogate's decision	Frame: patient's decision
Doctor: Do you want us to do CPR on your [relation]?	Doctor: If your [relation] were sitting right here with us, what would [s/he] tell you [s/he] wanted? Would [s/he] want us to do CPR?
Frame: DNR	Frame: AND
Doctor: Or [would s/he / do you] want a do-not-resuscitate order?	Doctor: Or [would s/he / do you] want us to allow a natural death?

CPR- cardiopulmonary resuscitation; DNR - do not resuscitate; AND - allow natural death

Table 2

Characteristics of Subjects

Variable	Value
Surrogates (n=252) *	
Age, mean (SD)	50 (12)
Female, n (%)	160 (63.5)
Race, n (%)	
White	191 (75.8)
Black	28 (11.1)
Asian	23 (9.1)
American Indian	1 (0.4)
Declined to state	9 (3.6)
College education or higher	204 (81.0)
Trust in medical profession, mean (SD) †	14.5 (3.8)
Prior experience with a relative in the ICU	204 (81.0)
Prior experience with a relative dying in the ICU	84 (33.3)
Believe in God/spirit, n (%)	194 (77.0)
Relationship	
Daughter	125 (48.8)
Son	54 (21.1)
Wife	39 (15.2)
Husband	38 (14.8)
Relative for whom they made decision (n=256) *	
Age, mean (SD), y	69 (12)
Relationship, n(%)	
Mother	117 (45.7)
Father	62 (24.2)
Wife	37 (14.5)
Husband	40 (15.6)
Health status, n (%)	
Excellent	23 (9.0)
Very good	57 (22.3)
Good	77 (30.1)
Fair	70 (27.3)
Poor	29 (11.3)

Variable	Value
Hospitalized in last year, n (%)	94 (36.7)

* We obtained information about the relative at the start of the survey but obtained information about the surrogate at the end of the survey (4 surrogates started, but did not complete, the survey).

[†] Range 5-25, with higher scores indicating greater trust.

Table 3

CPR choice, by experimental condition

Experimental condition	CPR, n (%)	Odds Ratio (95% Confidence Interval)		
		Base model	+ imbalanced covariate [*]	+ significant covariates [†]
Overall	141 (56)			
Unaroused, or “cold” emotional manipulation	70 (56)	Ref	Ref	Ref
Aroused, or “hot” emotional manipulation	71 (56)	1.03 (0.63-1.70)	0.96 (0.58-1.59)	0.89 (0.53-1.49)
MD does not attend to emotion	75 (59)	Ref	-	Ref
MD attends to emotion	66 (53)	0.78 (0.47-1.28)	-	0.77 (0.46-1.30)
MD frames CPR as the norm	81 (64)	Ref	-	Ref
MD frames no CPR as the norm	60 (48)	0.52 (0.32-0.87)	-	0.53 (0.32-0.89)
MD frames the CPR decision as the surrogate’s	70 (56)	Ref	-	Ref
MD frames the CPR decision as the patient’s	71 (56)	1.03 (0.63-1.69)	-	0.98 (0.58-1.64)
MD frames the alternative to CPR as “DNR”	80 (61)	Ref	-	Ref
MD frames the alternative to CPR as “AND”	61 (49)	0.58 (0.35-0.96)	-	0.59 (0.35-0.99)

DNR – do not resuscitate order, AND – allow natural death, Ref – reference

^{*} Surrogate age imbalanced between the emotion induction (+) and (-) conditions[†] Adjusted for surrogate’s age, relative’s age, and whether the relative was hospitalized in the last year.