

Prevalence of Disagreement About Appropriateness of Treatment Between ICU Patients/Surrogates and Clinicians

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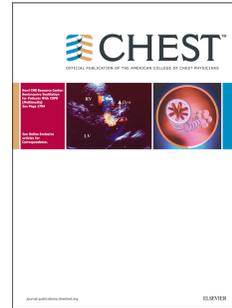
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Abbreviations list

ICU = intensive care unit

FS-ICU-24 = Family Satisfaction in the ICU questionnaire-24

PHQ2 = Patient Health Questionnaire-2

GAD7= Generalized Anxiety Disorder-7

IQR = interquartile range

ACCEPTED MANUSCRIPT

Abstract (250 words maximum)

Background: Intensive care unit (ICU) patients/surrogates may experience adverse outcomes related to perceived inappropriate treatment. The objective was to determine the prevalence of patient/surrogate-reported perceived inappropriate treatment, its impact on adverse outcomes, and discordance with clinicians.

Methods: We conducted a multicenter, prospective, observational study of adult ICU patients.

Results: For 151 patients, 1332 patient, surrogate, nurse, and physician surveys were collected. Disagreement between patients/surrogates versus clinicians regarding “too much” treatment being administered occurred in 26% of patients. Disagreement regarding “too little” treatment occurred in 10% of patients. Disagreement about perceived inappropriate treatment was associated with prognostic discordance ($p=0.02$) and lower patient/surrogate satisfaction (Likert scale 1-5 of 4 versus 5, $p=0.02$). Patient/surrogate respondents reported “too much” treatment in 8% of patients and “too little” treatment in 6% of patients. Perceived inappropriate treatment was associated with moderate or high respondent distress for 55% of patient/surrogate respondents and 35% of physician/nurse respondents, $p=0.30$. Patient/surrogate perception of inappropriate treatment was associated with lower satisfaction, (FS-ICU-24 69.9 versus 86.6, $p=0.002$) and lower trust in the clinical team (Likert scale 1-5 of 4 versus 5, $p=0.007$), but no statistically significant differences in depression (PHQ2 of 2 versus 1, $p=0.06$) or anxiety (GAD7 of 7 versus 4, $p=0.18$).

Conclusions: For approximately one third of ICU patients, there is disagreement between clinicians and patients/surrogates about the appropriateness of treatment. Disagreement about appropriateness of treatment was associated with prognostic discordance and lower

patient/surrogate satisfaction. Patients/surrogates who reported inappropriate treatment also reported lower satisfaction and trust in the ICU team.

ACCEPTED MANUSCRIPT

Introduction

Intensive care unit (ICU) physicians and nurses who deliver treatment they perceive as inappropriate are at increased risk for moral distress, emotional exhaustion, burnout, and a greater intention to leave their jobs.¹⁻⁴ However, no prior studies have examined the perceptions of inappropriate treatment from the perspectives of ICU patients and their families and whether these perceptions are associated with adverse outcomes.

There is a high degree of variability regarding the perceptions of appropriate treatment intensity, particularly near the end of life. Clinicians consider treatment as “too much” when it appears futile or unlikely to achieve benefit, but also potentially as not intensive enough when a patient declines a potentially life-saving procedure for a reversible condition. Some patients and families may interpret more intense treatment as an expression of receiving attention from medical professionals and being cared for, rather than being abandoned.⁵

Different perspectives on appropriate treatment intensity can lead to disagreements about the optimal treatment among clinicians, patients, and their family members. While disagreement about treatment intensity has been described^{6,7}, it is, however, unknown how common discordant perceptions about treatment intensity are, how frequently discordances are based on a perception of insufficient treatment intensity or excessive treatment, and whether there are instances where both, clinicians and patients/surrogates, perceive the treatment intensity as inappropriate. It is important to understand the nature of perceived inappropriate treatment in order to be able to implement measures to ameliorate disagreements about treatment intensity in critically ill patients. As a first exploratory step, we sought to assess the prevalence of perceived inappropriate treatment by patients and families, and discordance with clinicians.

The objectives of this study were to 1) determine the prevalence of perceived inappropriate treatment among ICU patients/surrogates and clinicians, 2) determine the prevalence of disagreement and its impact on prognostic discordance, and 3) determine the association of perceived inappropriate treatment with patient/surrogate satisfaction, depressive symptoms, anxiety, and trust in the medical team.

Materials and Methods

Study Design and Procedure

We conducted a prospective, observational study of patients, surrogates, physicians, and nurses at 6 adult ICUs in the United States and Hungary, nested within a larger study of clinicians in 68 ICUs in 12 countries.⁸ Consent was obtained from all participants. Each center enrolled patients over a consecutive 28-day block between May 4 and July 4, 2014. Enrollment occurred during daytime hours on weekdays. Inclusion criteria included admitted to the ICU and patient age ≥ 18 years old. Patients who did not have cognitive capacity to make their own medical decisions were excluded as survey respondents, but their surrogate decision maker was approached for enrollment. Patients were excluded if they or their surrogate decision maker were unavailable after three attempts, or if they required the use of a language interpreter. All physicians and nurses working in the ICU for the 28 day enrollment period were also approached for enrollment.

Patients, surrogates, nurses, and physicians completed paper or electronic surveys once daily. The time of completion of each survey was identified. Daily surveys assessing perceived inappropriate treatment, daily satisfaction, daily trust, distress, and prognosis were 9 questions in length. Additional questions assessing satisfaction, anxiety, and depressive symptoms were

assessed once on ICU discharge or death as described below. No incentives were given to participants for study participation. Questionnaires were translated using the Brislin method.⁹

Outcome Measures

Perceived Inappropriateness of Treatment

Every day during the ICU stay, a daily survey was administered to patients, surrogates, physicians, and nurses measuring perceived inappropriate treatment, reasons for perceived inappropriate treatment, and distress associated with perceived inappropriate treatment. Perceived inappropriate treatment was defined as a perception of “too much” or “too little” treatment using previously developed questionnaires.¹ “Too much” was defined as treatment that would not benefit the patient, was causing unnecessary burden, or was contrary to patient wishes. “Too little” treatment was defined as any additional treatment the patient should be receiving. Distress was measured using a 5-point Likert scale.¹ Questions regarding perceived inappropriate treatment were asked prior to questions about satisfaction, trust, anxiety, depression, and prognosis.

Satisfaction, Trust, Anxiety, and Depressive Symptoms

Patient/surrogate satisfaction was measured using the validated family satisfaction in the ICU questionnaire (FS-ICU-24), administered once on ICU discharge.¹⁰ The FS-ICU-24 consists of 24 questions. Scores range from 0 to 100, with higher scores representing increased satisfaction. On a daily survey, patient/surrogate satisfaction and trust were assessed with one question assessments using 5-point Likert scales (1 representing very low satisfaction or trust and 5 representing very high satisfaction or trust).^{11,12} Anxiety and depressive symptoms were

measured once at ICU discharge using the Patient Health Questionnaire-2 (PHQ-2) and the Generalized Anxiety Disorder-7 (GAD-7).^{13,14} PHQ-2 scores range from 0 to 6 and GAD-7 scores range from 0 to 21 with higher scores indicating increased symptoms.

Prognostic Estimates

On each daily survey, participants were asked to rate the likelihood that the patient would survive to hospital discharge with: strongly agree, agree, neutral, disagree, or strongly disagree responses. “Strongly disagree” and “disagree” were considered as predictions of death prior to hospital discharge. Prognostic discordance between the physician and patient/surrogate was defined as the difference in percentages of predictions of death prior to hospital discharge. Physician and patient/surrogate predictions offered within 24 hours of each other were considered for analysis.

Statistical Analyses

A total sample size of 78 patients was calculated to have 80% power to detect a difference of 20% in the FS-ICU-24 scale, assuming an α of 0.05, an effect size of 0.5, and a two-sided test. Chi-square and Wilcoxon rank-sum tests were used to report comparisons of categorical and continuous variables respectively. Multivariable linear regression was used to adjust continuous outcomes. Outcomes were adjusted for age, mechanical ventilation use, vasopressor use, and hospital location as these variables were considered to be markers of disease severity and related to outcomes of interest. For FS-ICU-24, PHQ-2, and GAD-7 (measured once at discharge), we tested the association of perceived inappropriate treatment at any time during the ICU stay (yes or no) with the outcome measure. For daily satisfaction and

trust, we tested the association of the first measurement of perceived inappropriate treatment with the first measurement of the outcome (to address the possible effects of intraindividual correlations from repeated surveys). Two-sided P values $<.05$ were considered statistically significant. All analyses were performed using SAS (version 9; SAS Institute Inc) in a Linux environment.

Results

Participants

During the 28-day study period, 563 patients were admitted to 6 ICUs and of these, 181 patients were enrolled in the study (Figure 1). Of the 181 enrolled patients, 151 patients (83%) had a completed patient/surrogate survey and were included in the analysis of patient/surrogate perceived inappropriate treatment (and its association with satisfaction, anxiety, depression, and trust). Of the 151 patients with a completed patient/surrogate survey, 100 patients also had a completed physician/nurse survey and were included in the analysis of discordance.

The characteristics of the 151 included patients are found in Table 1. The characteristics of the patient, surrogate, physician, and nurse respondents who completed surveys are found in Table 2. Regarding the 151 patients analyzed, we collected 112 daily surveys from 70 patient respondents, 234 surveys from 131 surrogate respondents, 517 surveys from 37 physician respondents, and 469 surveys from 93 nurse respondents.

Prevalence of Perceived Inappropriate Treatment

In 8% (8/100) of patients, patient/surrogate respondents reported that patients received “too much” treatment. In 6% (6/100) of patients, patient/surrogate respondents reported that patients received “too little” treatment. For the same cohort, clinicians reported “too much” treatment in 26% (26/100) of patients and “too little” treatment in 4% (4/100) of patients. The rates of patient/surrogate reported perceived inappropriate treatment were not statistically significantly different in the United States and Hungary (“too much treatment,” 9% versus 6%, $p=1.0$; “too little treatment,” 8% versus 3%, $p=0.66$).

Patient/family respondents listed one or more reasons for “too much” treatment: treatment is not what the patient would have wanted in 5% (5/100) of patients, treatment is not what the family would have wanted in 3% (3/100) of patients, treatment would unlikely help the patient get better in 3% (3/100) of patients, treatment was causing too much suffering in 1% (1/100) of patients, treatment would cost too much in 1% (1/100) of patients, and other reasons in 3% (3/100) of patients. Patient/family respondents listed one or more reasons for “too little” treatment: it is the patient’s preference to receive additional treatment in 6% (6/100) of patients, it is the surrogate’s preference to receive additional treatment in 2% (2/100) of patients, additional treatment would likely help the patient get better in 4% (4/100) of patients, additional treatment would relieve patient suffering in 3% (3/100) of patients, and other reasons in 2% (2/100) of patients. Physician/nurse respondents reported that the treatment intensity was not consistent with expected survival in 16% (16/100) of patients, treatment intensity was not consistent with expected quality of life in 15% (15/100) of patients, and that treatment intensity was not consistent with patient/surrogate wishes in 5% (5/100) of patients. Moderate or high

distress was present in 55% of individual patient/surrogate respondents and 35% of physician/nurse respondents who reported perceived inappropriate treatment, $p=0.30$ (Figure 2).

Associations with Perceived Inappropriate Treatment

Patient/surrogate perceived inappropriate treatment was associated with lower levels of satisfaction at the time of ICU discharge or death (FS-ICU-24 median [IQR] of 69.9 [58.6-82.2] compared to 86.6 [78.6-93.4], adjusted $p=0.002$ ($n=58$ respondents)). In addition, patient/surrogate perceived inappropriate treatment was associated with lower levels of satisfaction with medical care (Likert scale score of 4 [4-4] compared to 5 [4-5], adjusted $p<0.001$), and lower trust in the medical team (Likert scale score of 4 [4-5] compared to 5 [4-5], adjusted $p=0.007$) (Figure 3 and e-Table 1).

No statistically significant differences in anxiety (GAD7 median [IQR] of 7 [7-19] compared to 4 [2-11], adjusted $p=0.18$) or depressive symptoms (PHQ2 of 2 [1-4] compared to 0.5 [0-2], adjusted $p=0.06$) was observed among patients/surrogates who reported inappropriate treatment (Figure 3 and e-Table 1). Physician/nurse perceived inappropriate treatment was not associated with patient/surrogate anxiety, depressive symptoms, satisfaction or trust (e-Table 2). Patient discharge status (discharged alive versus dead) was not associated with differences in satisfaction and trust (e-Table 3).

Discordance

There was physician/nurse and patient/surrogate disagreement regarding “too much” treatment in 26% ($n=26$) of patients; and regarding “too little” treatment in 10% ($n=10$) of patients (Table 3). Discordance between physicians and patients/surrogates regarding “too much” treatment was associated with increased prognostic discordance. In instances where

discordance regarding “too much” treatment was present (one or more physicians reported “too much” treatment and no patients/surrogates “too much” treatment), 65% of physicians compared to 12% of patients/surrogates reported that the patient would not survive the hospital stay (53% prognostic difference). In instances where discordance regarding “too much” treatment was not present, 22% of physicians compared to 4% of patients/surrogates reported that the patient would not survive the hospital stay (18% prognostic discordance). The p value associated with the difference in differences (53% compared to 18%) was 0.02, indicating that when there was discordance between physicians and patients/surrogates regarding “too much” treatment, there was increased prognostic discordance (Figure 4). Discordance between the physicians and surrogates regarding inappropriate treatment was associated with lower daily surrogate satisfaction with medical care (Likert score of 4 [4-5] compared to 5 [4-5], $p=0.02$).

Discussion

Clinicians and patient/surrogates have discordant perceptions of inappropriate treatment in approximately one third of ICU patients. Disagreement about appropriateness of treatment was associated with lower patient/surrogate satisfaction as well as discordance about prognosis. Patients/surrogates who perceived inappropriate treatment reported lower satisfaction and trust in the ICU team with no statistically significant difference in psychological symptoms measured.

The finding that ICU clinicians think that the treatment that they deliver is “too much” in a substantial number of patients is consistent with previous findings.^{2,15} Our study shows that the clinicians’ perception of “too much” treatment is shared in about 1 in 5 instances by patients/surrogate, which suggests that clinicians and patients/surrogates are not always aware of each other’s opinions on treatment intensity. Even when there is awareness of perceptions, there

may be disagreement about appropriateness of treatment. Poor communication was found to be a major challenge in a study of California adult ICUs, where family meetings were held for only 61% of patients in which clinicians perceived treatment as inappropriate.² Yet, 80% of clinicians felt that inappropriate treatment was mainly a consequence of surrogate requests.

Our study data provides evidence that at least some of the differences between clinicians' and patients'/surrogates' perceptions of the appropriateness of treatment intensity are based on prognostic factors. Prior studies suggest that prognostic discordance is related to both family member misperceptions of the physicians' prognostic estimates, and also differences in belief regarding prognostic estimates.¹⁶ Since patients and surrogates are often unaware that their prognostic estimates differ from physicians, these findings highlight the importance of improving prognostic communication and understanding.¹⁷

Our study results indicate a need for better collaboration and communication between clinicians and patients about the goals of care and how they can be achieved. Results from a systematic review of 16 interventions showed that printed information, palliative care or ethics consultation, and regular, structured communication by the usual ICU team can reduce family distress and decrease the use of intensive treatments.¹⁸ Assessment of previously stated wishes as well as currently constructed preferences are necessary to achieving medical treatment that is aligned with patients' values and preferences.¹⁹⁻²² An official policy statement of the American Thoracic Society on potentially inappropriate treatments in ICUs emphasizes that it would be unethical if either clinicians or patients/surrogates had complete authority to make treatment decisions, but that clinicians and patients/surrogates should collaborate to decide upon the best course of action.⁶ Being able to implement appropriate processes for collaborative decision

making in the ICU requires a deeper understanding on clinicians' and patients'/surrogates' opinions and disagreements in opinion about appropriate treatment intensity.

Strengths of the study include the multi-center design in 2 countries. Our study also has important limitations. First, our included patients may have lower severity of illness than other populations, where rates of perceived inappropriate treatment may be higher. Second, our patient/surrogate response rate of 83% (151/181) was good for this type of study, but responders may differ from non-responders. Third, due to our small sample size and exploratory nature, we were unable to meaningfully analyze how patient/surrogate perceptions changed over time. Fourth, we excluded patients/surrogates who required language interpreters—a population who is likely to experience additional communication barriers and discordance with clinicians. Fifth, because assessment of appropriateness of treatment was assessed prior to assessments of other outcomes (such as satisfaction, anxiety, trust, etc.), it is possible that responses to the appropriateness of treatment question may have influenced subsequent assessments.

Conclusions

For approximately one third of ICU patients, clinicians disagreed with patients/surrogates about the appropriateness of medical treatment. Patients/surrogates who perceived inappropriate treatment reported lower satisfaction and trust in the ICU team with no significant difference in psychological symptoms. Disagreement about appropriateness of treatment was associated with disagreement about prognosis and lower patient/surrogate satisfaction. Understanding differences in perceptions of the appropriateness of treatment among patients, family members, and clinicians may play an important role in developing effective interventions to improve communication, satisfaction, and goal concordant treatment.

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MEW had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. CCD, LZ, OG, DT, JRC, RFH, VMB, AM, DMR, GE, MF, OS, PJN, RDP, and DDB contributed substantially to the study design, data acquisition, data analysis, data interpretation, and writing and critical revision of the manuscript.

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None

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Table 1. Characteristics of ICU patients

| Characteristic | n=151 patients |
|------------------------------------|----------------|
| Age, years | 64 (49-75.5) |
| Female sex | 54(36%) |
| Reason for ICU admission* | |
| Respiratory failure | 50 (33%) |
| Sepsis | 29 (19%) |
| Cardiovascular | 29 (19%) |
| Trauma | 18 (12%) |
| Gastrointestinal | 16 (11%) |
| Metabolic | 15 (10%) |
| Neurologic | 11 (7%) |
| Scheduled surgery | 11 (7%) |
| Other | 7 (5%) |
| Treatment during ICU admission* | |
| Invasive mechanical ventilation | 52 (34%) |
| Noninvasive mechanical ventilation | 16 (11%) |
| Vasopressors | 41 (27%) |
| Dialysis | 8 (5%) |
| ICU length of stay, days | 2.6 (1.3-6.2) |
| ICU mortality | 12 (8%) |
| Country of origin | |
| United States | 111 (74%) |
| Hungary | 40 (26%) |

All values are n (%) or median (interquartile range)

ICU=intensive care unit

* More than 1 choice possible

Table 2. Characteristics of survey respondents

| Characteristic | |
|------------------------------|--------------|
| Patients | n=70 |
| Age, years | 62 (48-71) |
| Female sex | 27 (44%) |
| Country of origin | |
| United States | 55 (79%) |
| Hungary | 15 (21%) |
| Surrogates | n=131 |
| Age | |
| < 40 years | 26 (23%) |
| 40-59 years | 48 (43%) |
| ≥ 60 years | 36 (32%) |
| Female sex | 83 (77%) |
| Country of origin | |
| United States | 71 (54%) |
| Hungary | 60 (46%) |
| Relationship to patient | |
| Child | 53 (41%) |
| Partner | 45 (34%) |
| Parent | 7 (5%) |
| Sibling | 5 (4%) |
| Other | 21 (16%) |
| Physicians and Nurses | n=131 |
| Age | |
| ≤ 40 years | 43 (43%) |
| 41-50 years | 33 (33%) |
| > 50 years | 23 (23%) |
| Female sex | 89 (69%) |
| Country of origin | |
| United States | 77 (59%) |
| Hungary | 54 (41%) |
| Role in the ICU | |
| Physician | 37 (29%) |
| Nurse | 93 (72%) |
| Unknown | 1 (1%) |
| ICU experience, years | |
| < 5 years | 39 (30%) |
| 5-10 years | 35 (27%) |
| >10 years | 36 (43%) |

All values are n (%) or median (interquartile range)

ICU=intensive care unit

* More than 1 choice possible

Table 3. Agreement between healthcare team members and patients/family regarding perceived inappropriate treatment during ICU admission

| Perceived “too much” treatment | | | |
|---|-----------------------|----------------------|---|
| | Physician/nurse “Yes” | Physician/nurse “No” | Weighted κ statistic (standard error) |
| Patient/family “Yes” | 4 (4%) | 4 (4%) | 0.13 (0.10) |
| Patient/family “No” | 22 (22%) | 70 (70%) | |
| Perceived “too little” treatment | | | |
| | Physician/nurse “Yes” | Physician/nurse “No” | Weighted κ statistic (standard error) |
| Patient/family “Yes” | 0 (0%) | 6 (6%) | Unable to calculate |
| Patient/family “No” | 4 (4%) | 90 (90%) | |

All values are number of patients (%) for whom agreement was assessed. A “yes” was defined as one or more respondents in that category reporting “yes” anytime during the intensive care unit admission. A “no” was defined as all respondents in that category reporting “no” anytime during the intensive care unit admission.

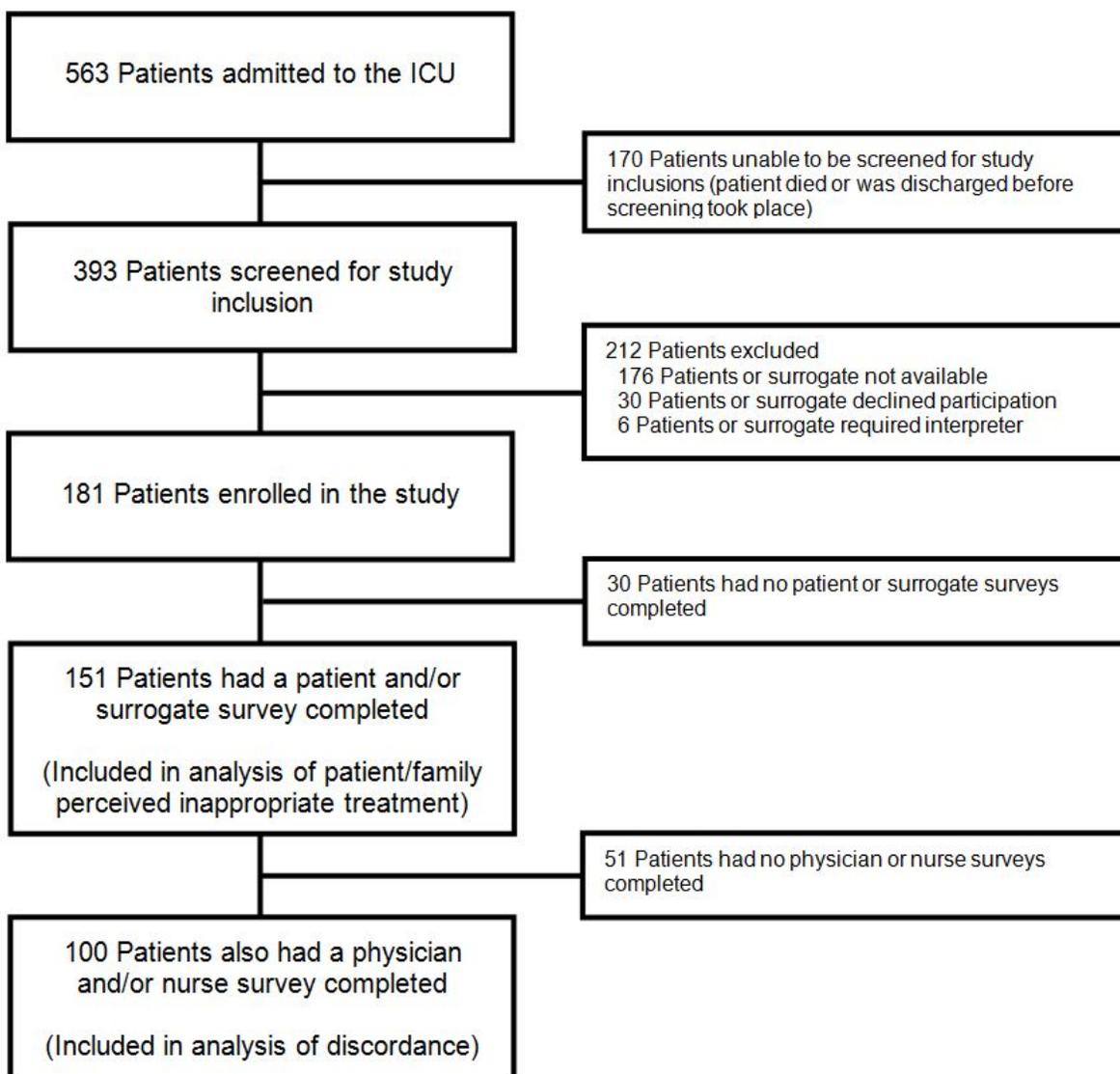
Figure legends

Figure 1. Study enrollment

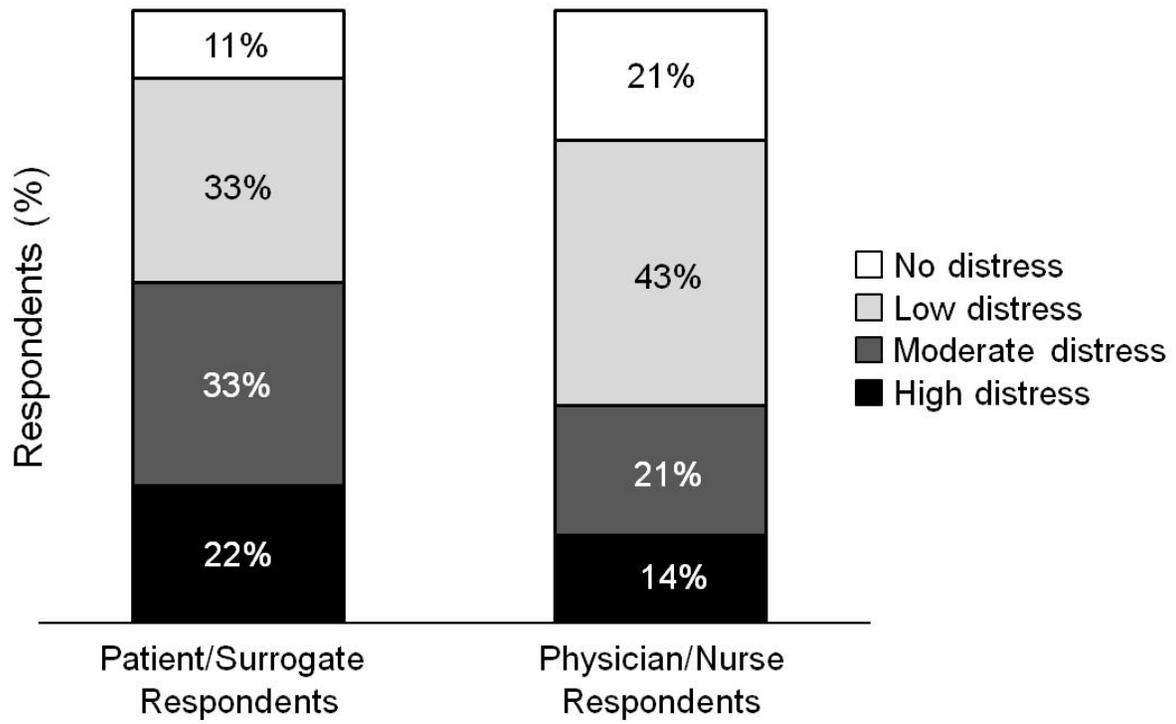
Figure 2. Level of respondent distress when the respondent reported perceived inappropriate treatment.

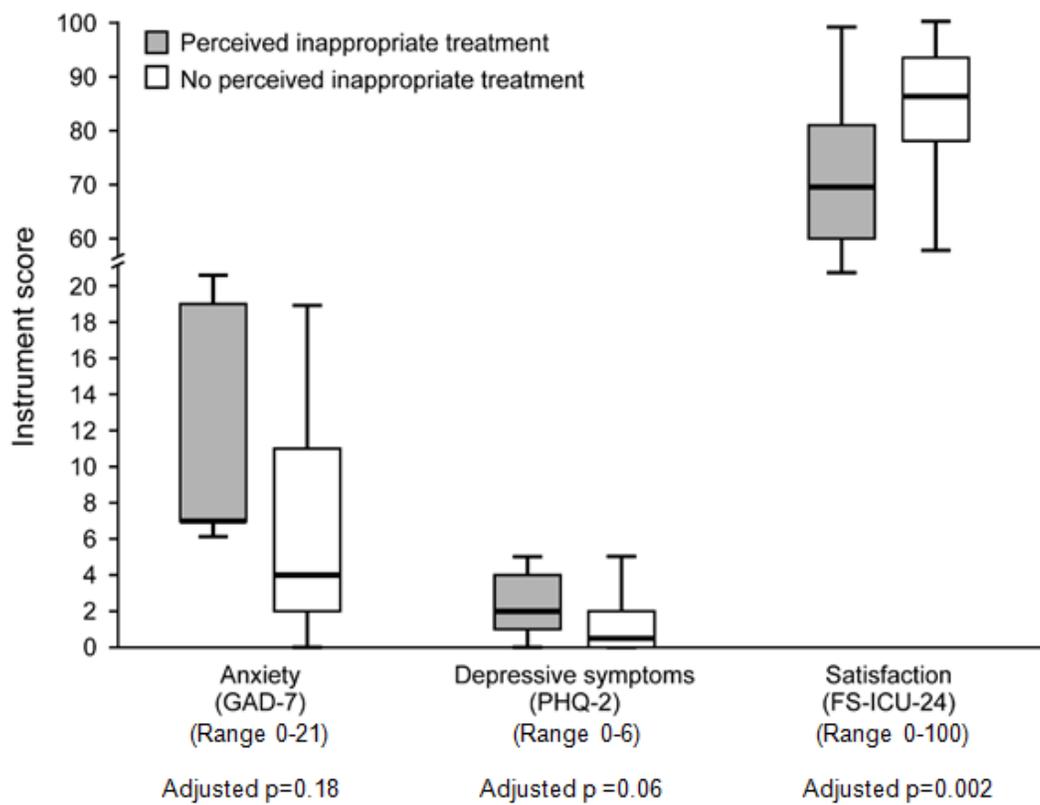
Figure 3. Impact of patient and surrogate perceived inappropriate treatment on satisfaction, anxiety, and depressive symptoms. The horizontal line within the box indicates the median scores, boundaries of the boxes indicate the 25th and 75th percentile scores, and the whiskers indicate the highest and lowest scores. P values were adjusted for age, mechanical ventilation use, vasopressors use, and hospital location.

Figure 4. Discordance between physicians and patients/surrogates regarding perceived inappropriate treatment and prognosis.

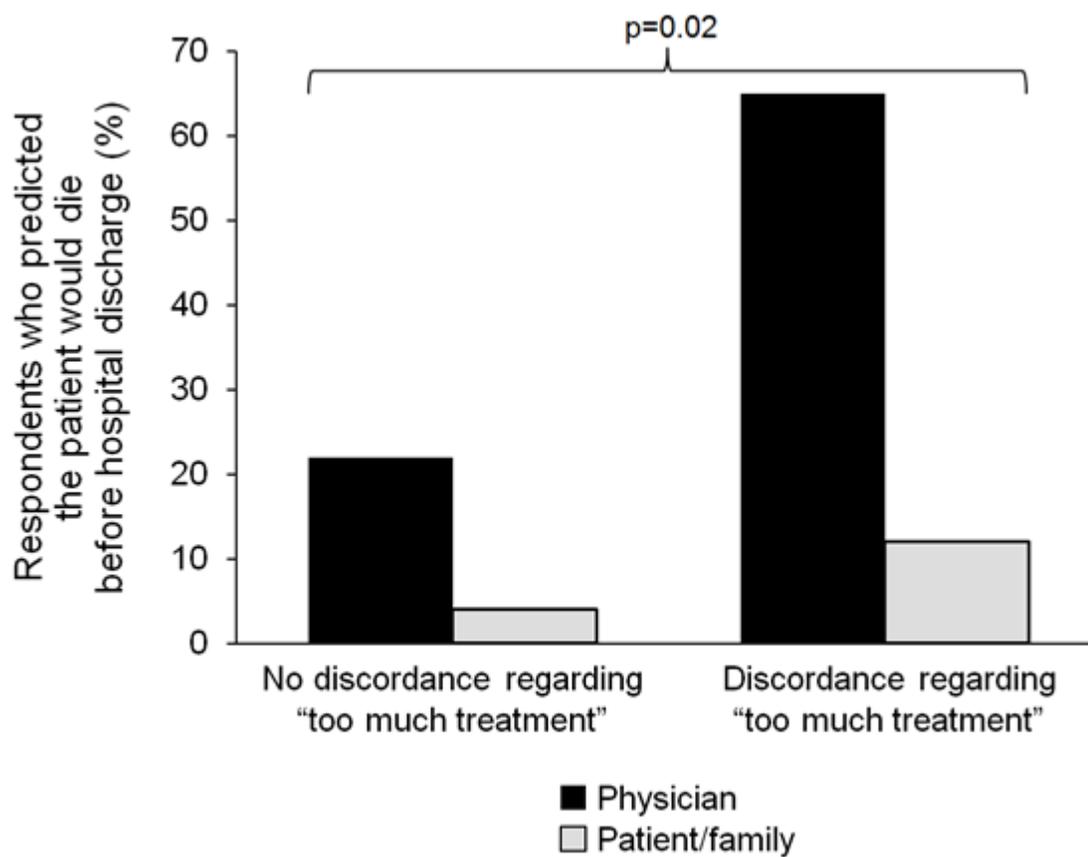


ACCEPTED





ACCEPTED



ACCEPTED


e-Table 1. Impact of patient/family perceived inappropriate treatment on satisfaction, trust, anxiety, and depressive symptoms.

| Perceived inappropriate treatment ("too much" or "too little") | | | | | | | |
|--|-----|-----------------|----|-----------------|-----|----------------------|---------------------------------|
| Total responses: n=422 | | Yes | | No | | p value (unadjusted) | p value (adjusted) ^a |
| | n | Median (IQR) | n | Median (IQR) | n | | |
| Satisfaction total (FS-ICU-24) | 58 | 69.9(58.6-82.2) | 8 | 86.6(78.6-93.4) | 50 | 0.02 | 0.002 |
| Daily satisfaction with care (scale of 1-5) | 144 | 4(4-4) | 12 | 5(4-5) | 132 | <0.001 | <0.001 |
| Daily trust in medical team (scale of 1-5) | 146 | 4(4-5) | 11 | 5(4-5) | 135 | 0.02 | 0.007 |
| Depressive symptoms (PHQ-2) | 37 | 2(1-4) | 7 | 0.5(0-2) | 30 | 0.04 | 0.06 |
| Anxiety (GAD-7) | 37 | 7(7-19) | 7 | 4(2-11) | 30 | 0.04 | 0.18 |
| Perceived "too much" treatment | | | | | | | |
| Total responses: n=422 | | Yes | | No | | p value (unadjusted) | p value (adjusted)* |
| | n | Median (IQR) | n | Median (IQR) | n | | |
| Satisfaction total (FS-ICU-24) | 58 | 59.8(39.9-73.3) | 4 | 86.1(77.1-93.4) | 54 | 0.007 | <0.001 |
| Daily satisfaction with care (scale of 1-5) | 144 | 4(4-5) | 6 | 5(4-5) | 138 | 0.17 | 0.10 |
| Daily trust in medical team (scale of 1-5) | 146 | 4.5(4-5) | 6 | 5(4-5) | 140 | 0.56 | 0.79 |
| Depressive symptoms (PHQ-2) | 37 | 4(1-4) | 3 | 1(0-2) | 34 | 0.10 | 0.14 |
| Anxiety (GAD-7) | 37 | 7(7-21) | 3 | 4.5(2-11) | 34 | 0.13 | 0.27 |
| Perceived "too little" treatment | | | | | | | |
| Total responses: n=418 | | Yes | | No | | p value (unadjusted) | p value (adjusted)* |
| | n | Median (IQR) | n | Median (IQR) | n | | |
| Satisfaction total (FS-ICU-24) | 58 | 72.7(67.1-85.0) | 5 | 85.9(77.1-93.2) | 53 | 0.27 | 0.52 |
| Daily satisfaction with care (scale of 1-5) | 142 | 4(4-4) | 9 | 5(4-5) | 133 | <0.001 | <0.001 |
| Daily trust in medical team (scale of 1-5) | 144 | 4(4-5) | 9 | 5(4-5) | 135 | 0.02 | 0.005 |
| Depressive symptoms (PHQ-2) | 37 | 2(2-4) | 5 | 1(0-2) | 32 | 0.10 | 0.15 |
| Anxiety (GAD-7) | 37 | 7(7-7) | 5 | 4(2-11) | 32 | 0.17 | 0.66 |

^a adjusted for patient age, mechanical ventilation use, vasopressors use, and hospital location

Abbreviations: FS-ICU-24, 24-item Family Satisfaction in the Intensive Care Unit questionnaire; GAD-7, Generalized Anxiety Disorder 7-Item scale; IQR, interquartile range; PHQ-2, Patient Health Questionnaire-2

e-Table 2. Impact of physician and nurse perceived inappropriate treatment on satisfaction, trust, anxiety, and depressive symptoms.

| Perceived inappropriate treatment ("too much" or "too little") | | | | | |
|--|-----------------|----|-----------------|----|-------------------------|
| | Yes | | No | | p value (unadjusted) |
| | Median (IQR) | n | Median (IQR) | n | |
| Satisfaction total (FS-ICU-24) | 87.5(71.3-93.8) | 7 | 84.1(75.5-91.3) | 28 | 0.76 |
| Daily satisfaction with care (scale of 1-5) | 5(4-5) | 29 | 5(4-5) | 74 | 0.84 |
| Daily trust in medical team (scale of 1-5) | 5(4-5) | 29 | 5(4-5) | 74 | 0.39 |
| Depressive symptoms (PHQ-2) | 2(0-4) | 3 | 1(0-1.5) | 20 | 0.36 |
| Anxiety (GAD-7) | 9(3-12) | 3 | 5(2-9.5) | 20 | 0.38 |

Abbreviations: FS-ICU-24, 24-item Family Satisfaction in the Intensive Care Unit questionnaire; GAD-7, Generalized Anxiety Disorder 7-Item scale; IQR, interquartile range; PHQ-2, Patient Health Questionnaire-2

e-Table 3. Association of ICU discharge status (discharged alive versus dead) and outcome. Regarding FS-ICU-24 (total satisfaction), PHQ2 (depression) or GAD7 (anxiety), there were 0 deaths (out of 58 patients analyzed), and regression models were not performed. Regarding daily satisfaction and daily trust, there were 12 deaths (out of 144 patients analyzed).

| Outcome | ICU Mortality Regression Estimate | p- value | Estimate of Interaction Of Perceived Inappropriate Treatment and ICU Mortality | p- value |
|--------------|---|-------------|---|-------------|
| FS-ICU-24 | Not enough data to estimate (no deaths) | | | |
| PHQ2 | Not enough data to estimate (no deaths) | | | |
| GAD-7 | Not enough data to estimate (no deaths) | | | |
| Satisfaction | -0.19 to 0.66 | 0.27 | -0.17 to 2.03 | 0.10 |
| Trust | -0.20 to 0.73 | 0.26 | -0.54 to 1.92 | 0.28 |