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Clinical paper

Treatment patterns and clinician stress related to care of out-of-hospital cardiac arrest patients with a do not attempt resuscitation order

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Abstract

Objective: This research investigated treatment patterns for out-of-hospital cardiac arrest patients with Do Not Attempt Resuscitation orders in Japanese emergency departments and the associated clinician stress.

Methods: A cross-sectional survey was conducted at 9 hospitals in Okayama, Japan, targeting emergency department nurses and physicians. The questionnaire inquired about the last treated out-of-hospital cardiac arrest patient with a Do Not Attempt Resuscitation. We assessed emotional stress on a 0–10 scale and moral distress on a 1–5 scale among clinicians.

Results: Of 208 participants, 107 (51%) had treated an out-of-hospital cardiac arrest patient with a Do Not Attempt Resuscitation order in the past 6 months. Of these, 65 (61%) clinicians used a "slow code" due to perceived futility in resuscitation (42/65 [65%]), unwillingness to terminate resuscitation upon arrival (38/65 [59%]), and absence of family at the time of patient's arrival (35/65 [54%]). Female clinicians had higher emotional stress (5 vs. 3; $P = 0.007$) and moral distress (3 vs. 2; $P = 0.002$) than males. Nurses faced more moral distress than physicians (3 vs. 2; $P < 0.001$). Adjusted logistic regression revealed that having performed a "slow code" (adjusted odds ratio, 5.09 [95% CI, 1.68–17.87]) and having greater ethical concerns about "slow code" (adjusted odds ratio, 0.35 [95% CI, 0.19–0.58]) were associated with high stress levels.

Conclusions: The prevalent use of "slow code" for out-of-hospital cardiac arrest patients with Do Not Attempt Resuscitation orders underscores the challenges in managing these patients in clinical practice.

Keywords: Do not attempt resuscitation, Out-of-hospital cardiac arrest, Emergency department, Clinicians, Slow code, Stress

Introduction

Cardiac arrest is an abrupt and catastrophic medical emergency during which any delay in resuscitation significantly reduces the chance of survival.[1] Given limited and uncertain information about patients' comorbidities, functional status, underlying cause of the cardiac arrest, and their wishes with regard to medical care, cardiopulmonary resuscitation (CPR) is nearly universally provided to patients with out-of-hospital cardiac arrest (OHCA). Despite recent progress, the global survival rate to hospital discharge after OHCA is estimated to be only 8.8%,[2] suggesting the vast majority of resuscitation efforts result in poor outcomes. In Japan, emergency medical services (EMS) personnel are not allowed to declare a patient dead on the scene unless there are objective signs of death, defined as rigor mortis, dependent lividity, or decomposition. They are obligated to transport all patients for whom resuscitation is initiated.[3] Indeed, 97% of adult OHCA patients (605,573/621,159) received CPR and were taken to the hospital,[4] unlike the United States, where termination of resuscitation may be considered.[5]

A Do Not Attempt Resuscitation (DNAR) or "Allow Natural Death" order is an advance directive to withhold resuscitative measures at the time of cardiac arrest. EMS personnel sometimes encounter OHCA patients with DNAR orders (OHCA/DNAR patients), for whom resuscitation is frequently attempted globally.[6,7]

In Japan, the law mandates EMS personnel to provide emergency care, including CPR even in the presence of advance direc-

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tives such as the DNAR order. However, the specifics of how this directive is managed can vary based on local protocols. In the case of Okayama City, the regional guidelines require EMS personnel to perform CPR irrespective of an existing DNAR order. Consequently, we recently reported 98% of OHCA/DNAR patients (120/122) received CPR by EMS personnel in the suburban city of Okayama, Japan.[8] Little is known about how OHCA/DNAR patients are managed after emergency department (ED) arrival. In the prehospital setting, we found 30% of EMS personnel who provided CPR to OHCA/DNAR patients were highly stressed by what they perceived as care inconsistent with patients' wishes.[8] It is unknown whether healthcare professionals in the ED perceive a similar emotional burden when care for OHCA/DNAR patients.

A practical dilemma between continuing or stopping resuscitation may arise from uncertainty about the validity of DNAR decision, contradictory family wishes, or the perception that the cause of cardiac arrest may be readily reversible. [5,9] More importantly, perceived medical futility and reluctance to fully terminate resuscitation may contribute to incomplete resuscitative efforts, termed a "slow code". A "slow code" refers to a practice in which medical professionals respond to a cardiac arrest in a deliberate and less enthusiastic manner, often performing CPR without the vigor associated with resuscitative efforts. This practice gives the appearance of taking active resuscitative measures, even when they are performed without genuine intent to fully resuscitate the patient.[10] Although a "slow code" is considered deceptive and paternalistic,[11] previous surveys documented over two-thirds of clinicians had participated in "slow code" in the intensive care unit or general inpatient ward.[12,13] The ambiguity and ethical implications of this practice can be sources of significant stress and conflict for healthcare providers. To date, no studies have evaluated the frequency and reasons for performing a "slow code" or how it affects clinicians in the ED.

Accordingly, the objectives of this study were to: (1) investigate how OHCA/DNAR patients were managed in the ED and the associated clinical context; (2) evaluate ethical dilemmas, physical and emotional stress for clinicians resulting from OHCA/DNAR patient care.

Methods

Study design and participants

This was a multicenter cross-sectional survey study conducted in the western suburban area of Okayama, Japan. Nine acute care hospitals were included: 5 tertiary hospitals (Okayama University Hospital, Kawasaki Medical School Hospital, Japanese Red Cross Okayama Hospital, Kurashiki Central Hospital, and Tsuyama Chuo Hospital) and 4 secondary hospitals (Okayama City Hospital, Okayama Saiseikai General Hospital, Kawasaki Medical School General Medical Center, and Okayama Central Hospital). Okayama has a population of approximately 1.9 million in an area of 7,114 km^2. We invited clinicians in participating EDs, including attending physicians, residents, and nurses to complete the survey between January 1 and January 31, 2023. We distributed the survey using Google Forms, then sent two reminder emails to encourage response. The Okayama University Hospital Ethics Committee approved this study (K2207-014), interpreting the completion of the survey as provision of informed consent.

Survey questionnaire

The survey was developed and its reporting was aligned with the guidelines from "A Consensus-Based Checklist for Reporting of Survey Studies."[14] We did not conduct pretesting, primarily due to our reliance on a rigorous multidisciplinary panel review and development process. This panel, comprising 8 emergency physicians, 2 emergency nurses, and 1 nurse expert in medical ethics, collaboratively designed and reviewed an anonymous and structured questionnaire. Previous work and our clinical practice informed design of the survey.[8,15,16] The final questionnaire is presented in Supplementary Appendix 1. The survey consisted of 4 sections: (1) respondent demographic characteristics; (2) experience of taking care of OHCA/DNAR patients; (3) assessment of clinician stress during or after treatment of OHCA/DNAR patients; and (4) attitudes and opinions regarding treatment of OHCA/DNAR patients. For the second part, we encouraged participants to recall the number of OHCA patients with or without DNAR order they had cared for in the previous 6 months. We selected this recall period based on previous work.[17] We included questions about the last OHCA/DNAR patient treated in the previous 6 months, specifically patient characteristics, the circumstances of resuscitation, and treatment decisions. We identified these topics based on both medical and non-medical considerations, including patient, family, and clinician perspectives as well as medicolegal concerns.[16] To evaluate perceived psychological stress among clinicians related to the treatment of the most recent OHCA/DNAR patient, we used a visual analog scale (VAS) from 0 to 10. We assessed moral distress on a scale of 1 to 5. We mea-

Table 1 – Baseline Characteristics of the Participants.

Characteristics	Total sample (N = 208) No. (%)
Age, median (IQR), y	33 (28–42)
Gender	
Female	112 (54)
Male	92 (44)
Gender diverse	0 (0)
Prefer not to state	4 (2)
Profession	
Nurses	106 (51)
Physicians	102 (49)
Tertiary care hospital affiliation	112 (54)
Physician's specialty	
Emergency medicine	52 (50)
Critical care medicine	2 (2)
Internal medicine	3 (3)
Junior resident	30 (29)
Senior resident	11 (11)
Others	5 (5)
Board-certified nurse specialist	
None	98 (92)
Critical care	2 (2)
Others	7 (7)
Career duration, median (IQR), y	8 (3–17)
Career duration in the ED, median (IQR), y	4 (1–9)
Experience of advance care planning assistance	105 (50)

ED, emergency department.

Table 2 – Characteristics of the OHCA/DNAR patients for whom the participants cared most recently in the past 6 months based on the resuscitation code on arrival in the ED.

Treatment decision on arrival in the ED	Total $N = 107$	"Full code" $n = 27$	"Slow code" $n = 65$	Termination of resuscitation $n = 15$	P value
From whom or how a DNAR order was confirmed before patient arrival to the hospital					0.70
EMS personnel	64 (60)	14 (52)	39 (60)	11 (73)	
Nursing facility staff	32 (30)	9 (33)	17 (26)	6 (40)	
Primary care physician or family physician	5 (5)	1 (4)	4 (6)	0 (0)	
Patient's medical record	38 (36)	10 (37)	25 (38)	3 (20)	
Age of the patient					0.31
0–19 years	0 (0)	0 (0)	0 (0)	0 (0)	
20–39 years	0 (0)	0 (0)	0 (0)	0 (0)	
40–59 years	1 (1)	1 (4)	0 (0)	0 (0)	
60–79 years	8 (7)	2 (7)	5 (8)	1 (7)	
80–89 years	66 (62)	13 (48)	45 (69)	8 (53)	
>90 years	32 (30)	11 (41)	15 (23)	6 (40)	
Gender of the patient					0.98
Female	32 (30)	8 (30)	19 (29)	5 (33)	
Male	57 (53)	15 (56)	34 (52)	8 (53)	
Gender diverse	0 (0)	0 (0)	0 (0)	0 (0)	
Unknown	18 (17)	4 (15)	12 (18)	2 (13)	
Time of patient arrive in the ED					0.71
Daytime	37 (35)	9 (33)	24 (37)	4 (27)	
Early night	37 (35)	10 (37)	23 (35)	4 (27)	
Late night	33 (31)	8 (30)	18 (28)	7 (47)	
Location of OHCA					0.79
Home	42 (39)	10 (37)	25 (38)	7 (47)	
Nursing facility	63 (59)	17 (63)	38 (58)	8 (53)	
Public place	2 (2)	0 (0)	2 (3)	0 (0)	
Initial rhythm recorded at the time of EMS personnel arrival					0.22
Shockable rhythm	1 (1)	1 (4)	0 (0)	0 (0)	
Non-shockable rhythm	106 (99)	26 (96)	65 (100)	15 (100)	
"Did you confirm that the patient had an explicit DNAR order immediately after patient's arrival in the ED?"					0.83
Yes	93 (87)	23 (85)	56 (86)	14 (93)	
Attempted, but failed	9 (8)	3 (11)	5 (8)	1 (7)	
No	5 (5)	1 (4)	4 (6)	0 (0)	
The way to confirm an explicit DNAR order					0.30
Discussion with the patient's family	94 (95)	23 (96)	57 (93)	14 (100)	
Discussion with the patient's nursing facility staff	20 (20)	2 (8)	16 (26)	2 (14)	
Discussion with the patient's primary care physician	1 (1)	1 (4)	0 (0)	0 (0)	
Checked a written document	6 (6)	2 (8)	4 (7)	0 (0)	
First impression of the patient's physical condition*	4.7 (0.7)	4.3 (1.0)	4.8 (0.5)	4.9 (0.4)	0.05
Initial rhythm recorded at the time of ED arrival					0.72
Shockable rhythm	1 (1)	0 (0)	1 (2)	0 (0)	
Non-shockable rhythm	106 (99)	27 (100)	64 (98)	15 (100)	
ROSC					0.28
Temporarily	13 (12)	5 (19)	8 (12)	0 (0)	
Persistent	4 (4)	2 (7)	2 (3)	0 (0)	
No ROSC	90 (84)	20 (74)	55 (85)	15 (100)	
Cause of the cardiac arrest					0.17
Cardiac or presumed cardiac	25 (23)	11 (41)	10 (15)	4 (27)	
Cerebrovascular disease	3 (3)	0 (0)	3 (5)	0 (0)	
Respiratory disease	7 (7)	2 (7)	5 (8)	0 (0)	
Cancer	7 (7)	3 (11)	2 (3)	2 (13)	
Airway obstruction/asphyxia	6 (6)	2 (7)	4 (6)	0 (0)	
Other medical cause	15 (14)	2 (7)	10 (15)	3 (20)	
Old age	19 (18)	1 (4)	14 (22)	4 (27)	
Unknown	25 (23)	6 (22)	17 (26)	2 (13)	
Team briefing prior to patient's arrival	90 (84)	20 (74)	57 (88)	13 (87)	0.26
Debriefing	42 (39)	14 (52)	24 (37)	4 (27)	0.23

ED, emergency department; OHCA, out-of-hospital cardiac arrest; DNAR, Do Not Attempt Resuscitation; EMS, emergency medical services; ROSC, return of spontaneous circulation.

* Data are expressed as mean with SD.

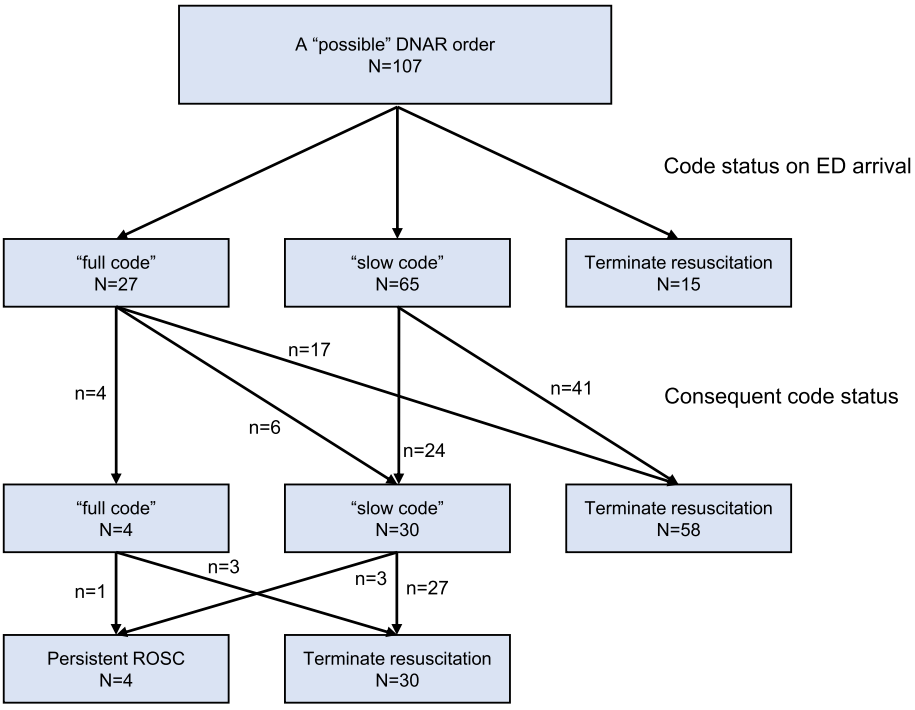


Fig. 1 – Flowchart for management of OHCA/DNAR patient after arrival in the ED. Abbreviations: OHCA, out-of-hospital cardiac arrest; DNAR, Do Not Attempt Resuscitation; ED, emergency department; ROSC, return of spontaneous circulation.

sured post-traumatic stress disorder (PTSD) using a short version of the Post-traumatic Diagnostic Scale. We defined high risk individuals for PTSD as those who scored 3 or greater out of 9.[18] Similarly, we measured burnout using a short version of the Maslach Burnout Inventory. We identified individuals as high risk for burnout if they answered more than once a week to the single item measures.[19] The final section included questions about attitude toward treating OHCA/DNAR patients and "slow codes".

Definition

To focus on ED resuscitation of OHCA patients who were presumably of DNAR, we defined an OHCA/DNAR patient as a person without prehospital return of spontaneous circulation (ROSC) and who was assumed to have a DNAR order based on the communication between clinicians and EMS personnel or nursing home staff before arrival to the ED, or information obtained from medical record. The questionnaire included questions about briefing and debriefing. Briefing was defined as the sharing of the resuscitation policy with team members before the patient's arrival, while debriefing referred to the intra-team reflective practice conducted after OHCA treatment.

In our survey study, the term "slow code" refers to resuscitation efforts that are not in full accordance with resuscitation guidelines, often performed in medically futile situations. This definition is based on the actions and perceptions of participants, rather than any official documentation in the medical record.

Data analysis

We summarized continuous variables using median with interquartile ranges or mean with standard deviation, as appropriate, and categorical variables as frequencies and percentages. We categorized the last OHCA/DNAR patient for whom participants cared in the previous 6 months into 3 groups based on the resuscitation code on arrival in the ED: "full code", "slow code", and "termination of resuscitation". We then compared the 3 groups on their characteristics using chi-square tests and analysis of variance (ANOVA). Among respondents who cared for at least 1 OHCA/DNAR patient in the last 6 months, we compared emotional stress and moral distress levels using Wilcoxon signed-rank tests. We used Mann-Whitney U tests to compare emotional stress or moral distress differences by gender, profession, and whether briefing or debriefing had been conducted. We divided participants into 2 groups based on the extent of stress in managing the last OHCA/DNAR patient: high stress group (defined as VAS score of 7 or higher) and low stress group (defined as VAS score of 6 or lower).[20] We performed multiple logistic regression analysis to identify predictors of high stress, estimating adjusted odds ratios (ORs) with their 95% confidence intervals (CIs). Covariates included participants' gender, profession, whether "slow code" was performed, whether debriefing was conducted, and participants' ethical values regarding "slow code". We selected these variables based on the previous reports and our hypothesis that these variables might associate with clinicians' high stress levels.[13,21,22] Multicollinearity was assessed using the Variance Inflation Factor (VIF). We considered statistical significance at a P value of <0.05. Statistical analyses and generation of summary graphs were performed in Prism 9.0 (GraphPad, San Diego, CA).

Results

Participant demographic and characteristics

The survey had an overall response rate of 67% (208/310), with a 64% response rate for nurses (106/166) and a 71% response rate

Fig. 2 – For what reasons the resuscitation code was selected at the time of ED arrival according to the code status (a–c). The numbers adjacent to the bars represent the actual count of responses. Abbreviations: DNAR, Do Not Attempt Resuscitation.

for physicians (102/144). Characteristics of respondents are shown in Table 1. Among 208 participants, median (IQR) age was 33 (28–42) years; 112 (54%) were female, 92 (44%) were male, and 4 (2%) preferred not to answer.

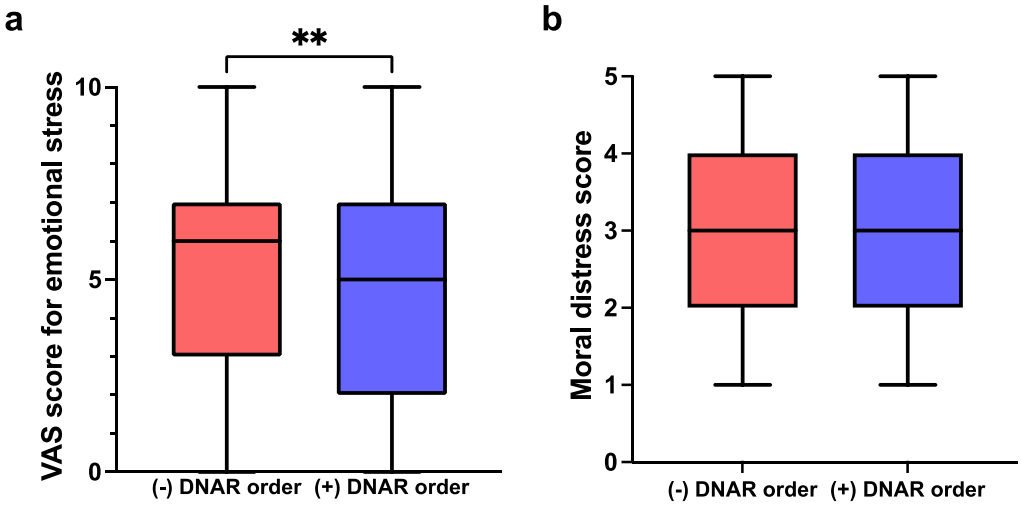
Experience of taking care of OHCA/DNAR patients

Reportedly, 187 (90%) respondents treated at least 1 OHCA patient during the last 6 months before the survey. Among them, 107 of 187 (57%) respondents cared for at least 1 OHCA/DNAR patient without ROSC on hospital arrival during the 6 months.

Of these 107 respondents, 72 (67%) indicated that they had applied a "slow code" at least once.

Table 2 shows the characteristics of the OHCA/DNAR patients most recently treated by respondents, stratified by type of resuscitation on arrival in the ED. Of 107 treated cases, 27 (25%) participants continued "full code" resuscitation, 65 (61%) participants provided

Emotional stress and moral distress by DNAR order status



Emotional stress and moral distress in OHCA/DNAR patient treatment by gender and profession

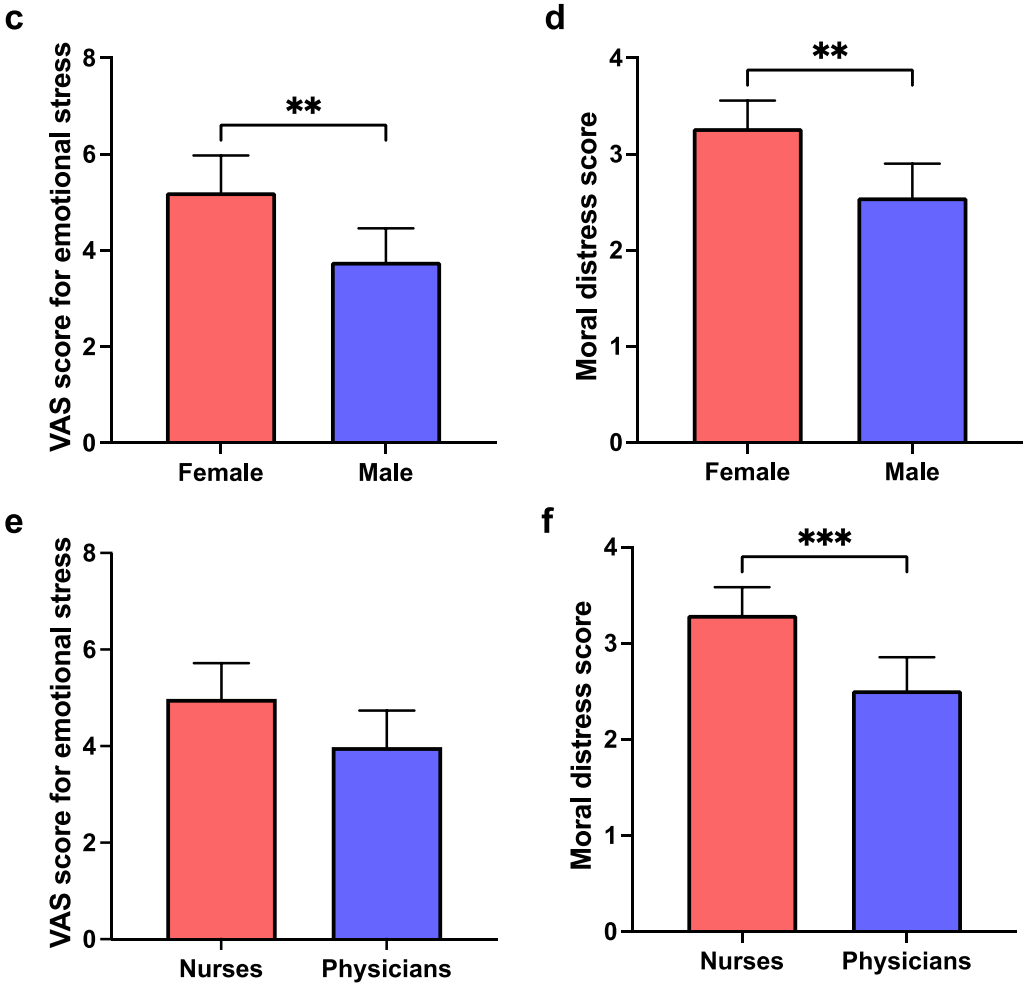


Table 3 – A multiple logistic regression analysis to identify factors contributing to clinicians' high stress during or after treatment of OHCA/DNAR patient.

Variables	Adjusted OR (95% CI)	P value
Gender		
Female	Reference	
Male	0.81 (0.24–2.68)	0.73
Profession		
Nurses	Reference	
Physicians	0.56 (0.16–1.86)	0.35
Treatment decision on arrival		
No "slow code"	Reference	
"Slow code"	5.09 (1.68–17.87)	0.007
Ethical values regarding "slow code"*	0.35 (0.19–0.58)	<0.001
Debriefing was conducted	1.76 (0.64–4.95)	0.28

Adjusted odds ratios account for the following covariates: participants' sex, profession, performance of "slow code", conduct of debriefing, and participants' ethical values regarding "slow code".

OHCA, out-of-hospital cardiac arrest; DNAR, Do Not Attempt Resuscitation.

* On the scale of 1–5, 1 indicates strongly disagree or consider "slow code" as unethical, and 5 indicates strongly agree or consider "slow code" as ethical.

"slow code" resuscitation, and 15 (14%) participants terminated resuscitation upon arrival. "Slow code" was characterized by any one of the following: refraining from advanced airway management (40/65 [62%]), improper chest compressions (22/65 [34%]), and refraining from epinephrine administration (20/65 [31%]). Fig. 1 depicts the evolution of resuscitation strategy and eventual outcomes.

Fig. 2 shows the reasons that informed the initial treatment decision at the time of ED arrival, which were classified into three categories: patient related factors, family member related factors, and clinician's feelings or characteristics. For 96 (90%) of the patients, the final treatment was decided upon in discussion with their family (Supplementary Fig. 1). Out of the 107 cases, 5 participants received criticism or complaints from families regarding their resuscitation practice. Three were criticized for not attempting CPR despite the family's wishes, while 2 faced complaints for attempting CPR against a patient's DNAR order.

Clinician emotional stress, moral distress, PTSD, and burnout feeling during or after treatment of OHCA/DNAR patients

We assessed emotional stress or moral distress among respondents who cared for at least 1 OHCA/DNAR patient in the last 6 months (Fig. 3). Emotional stress levels during or after treatment of an OHCA/DNAR patient were lower than those associated with treatment of an OHCA patient without a DNAR order (5 vs 6; $P = 0.004$). During or after treatment of OHCA/DNAR patient, female clinicians had higher VAS score for emotional stress (5 vs. 3; $P = 0.007$) and higher moral distress score (3 vs. 2; $P = 0.002$) compared with male clinicians. Nurses had higher moral distress score compared with physicians (3 vs. 2; $P < 0.001$). The VAS score for emotional stress and the moral distress score were similar, regardless of whether a briefing or debriefing had been conducted (Supplementary Fig. 3). We compared two groups of clinicians: high stress group and low stress group (Supplementary Table 1). A multiple logistic regression analysis revealed that having performed a "slow code" (adjusted OR, 5.09 [95% CI, 1.68–17.87]) and having stronger ethical concerns about performing a "slow code" (adjusted OR, 0.35 [95% CI, 0.19–0.58]) were associated with high stress levels (Table 3). There were no signs of multicollinearity (VIF range: 1.015–1.572).

A short version of the Post-traumatic Diagnostic Scale revealed that 5 out of 107 (5%) participants were identified as being at high risk of PTSD (Supplementary Fig. 3). When assessed a short version of the Maslach Burnout Inventory, 5 out of 107 (5%) and 2 out of 107 (2%) participants were determined to be at high risk of burnout in terms of emotional exhaustion and depersonalization domain, respectively (Supplementary Fig. 4).

Finally, clinicians' thought or opinions regarding the treatment of OHCA/DNAR patients and "slow code" practice is presented in Supplementary Fig. 5.

Discussion

We described treatment decisions after arrival in the ED for OHCA patients who had DNAR orders and characterized the clinical context and results of these decisions. Of 208 participants, 107 (51%) encountered at least 1 OHCA/DNAR patient in the ED within the past 6 months. Based on the available information prior to patients' arrival, clinicians most likely chose to perform a "slow code" (65/107

Fig. 3 – Clinician emotional stress or moral distress during or after treatment of OHCA/DNAR patients. An OHCA/DNAR patient is defined as a person without prehospital ROSC who was assumed to have a DNAR order based on communication between clinicians and EMS personnel or nursing home staff before arrival to the ED, or information obtained from the medical record. Top: VAS for emotional stress (a) and moral distress score (b) according to the presence or absence of DNAR order during transfer ($n = 103$). Box and vertical line in box indicate interquartile range and median, respectively. Error bars indicate min to max values. Middle: VAS for emotional stress (c) and moral distress score (d) categorized by gender: n = 52 for female (12 physicians and 40 nurses) and $n = 51$ for male (41 physicians and 10 nurses). Data are expressed as mean scores; error bars indicate 95% CI. Bottom: VAS for emotional stress (e) and moral distress score (f) categorized by profession $n = 50$ for nurses (40 females and 10 males) and $n = 53$ for physicians (12 females and 41 males). Data are expressed as mean scores; error bars indicate 95% CI. Indicators of significance were reported as $^{**}P < 0.01$ and $^{***}P < 0.001$ in figures. Abbreviations: OHCA, out-of-hospital cardiac arrest; DNAR, Do Not Attempt Resuscitation; EMS, emergency medical services; ED, emergency department; ROSC, return of spontaneous circulation.

[61%]). Feelings of futility in resuscitation, absence of family at the time of patient arrival, and unwillingness to terminate resuscitation upon arrival informed the decision to perform a "slow code". Performing a "slow code" and viewing this approach as unethical "slow code" were significantly associated with high stress among respondents.

Importantly, the fact that clinicians reportedly commonly applied "slow code" to OHCA/DNAR patients underscores the challenges in managing OHCA/DNAR patients in clinical practice. Our data indicate that advanced airway management was not provided in the majority of "slow code" cases. Intubating an OHCA patient who may have a DNAR order raises several ethical concerns, including the possibility of medical inappropriateness or causing excessive burden to the patient post-resuscitation.[23] Our data showed that participants vary widely in their beliefs about the ethics of conducting "slow code". "Slow code" potentially occurs due to anxiety about withholding resuscitation of OHCA/DNAR patients or hesitation to perform "full code" on them. Nevertheless, our analysis demonstrated that performing "slow code" against clinician ethical values contributed to high stress (Table 3). Although not evident in this study, debriefing after caring an OHCA/DNAR patient may relieve emotional stress and mitigate moral distress (Supplementary Fig. 2).[22,24]

A large international survey found 8.0% of participating clinicians (320/4,018) perceived their last CPR attempt as inappropriate.[15] Although it was uncertain how many patients with possible DNAR order were involved in the survey, objective indicators of poor prognosis and poor first physical impression were associated with the perception of inappropriate CPR. Meanwhile, concern for the validity of DNAR compels nursing home staff to activate EMS despite a DNAR order.[25] A previous study in Japan found that a DNAR order was commonly confirmed by verbal communication (27/45 [60%]), and written documentation was available in only 27% (12/45) during prehospital OHCA care.[7] Our results support that uncertainty and unavailability of a valid DNAR order as well as the perception of CPR as a medically futile were associated with a decision to perform a "slow code" after ED arrival. Therefore, a vast majority of clinicians attempted to confirm explicitness of patients' DNAR order immediately after arrival and made a final treatment decision primarily by discussing with family (Table 2 and Supplementary Fig. 1). Similar trends were observed in China, where emergency physicians prioritized the wishes of family members.[26] Furthermore, it is notable that unwillingness to terminate resuscitation upon arrival ranked high as reasons to continue CPR (Fig. 2). This may be related to the fact that the decision to stop CPR immediately was challenging once it was initiated.[27] A recent study also suggests that clinicians were inclined to continue resuscitation efforts if CPR had been initiated by EMS personnel, regardless of DNAR orders.[28]

Unexpectedly, we observed that clinician emotional stress levels were lower when treating an OHCA patient with a DNAR order rather than treating those without a DNAR order. These results were inconsistent from our former study conducted among EMS personnel who might struggle with conflicts between their obligations to perform CPR and the patient's autonomy.[8] Our results might be explained by the fact that healthcare professionals in the ED are generally exposed to high stress during resuscitation of young patients who presumably do not have DNAR orders.[29,30] Extensive literature indicates that female clinicians and nurses are more likely susceptible to emotional stress and burnout than male or other clinicians.[21,31–33] Moreover, female healthcare professionals and nurses are more likely to be affected by moral distress than male or other healthcare professionals.[34,35] Our study obtained results in line with these previous findings. In essence, female clinicians are more susceptible to burnout compared to their male colleagues, primarily due to factors such as work-life integration challenges, gender bias and discrimination, experiences of sexual harassment, and issues related to autonomy and workload.[36] Moreover, factors intensifying burnout susceptibility in nurses include the demands of patient care, strained dynamics or inadequate collaboration with physicians, the nature of their work environment, and diminished autonomy.[37]

Our study yields insights to issues that arise when clinicians care OHCA/DNAR patients in the ED. Limited time, information, and a chaotic environment forced clinicians to make a challenging decision. Needless to say, respecting patient preferences, autonomy, and dignity is vital; however, considering the ethical implications including "slow code" is of crucial to better cope with clinicians' mental health and well-being, which can potentially affect clinician performance and patient outcome. Although thorough preparation before patient arrival, shared decision-making, respecting team members, and team discussion or reflection may be a key aspect to consider, future research is encouraged to examine interventions to take better care of OHCA/DNAR patients and individual clinicians involved.

Limitations

There are several limitations to our study. First, a response bias may exist. Second, we did not collect data on the number of clinicians involved in a single OHCA/DNAR patient's care, individual roles, ED crowdedness, or family members. These unmeasured factors may influence our results. Also, patients' characteristics may include duplicate data if participants recalled an identical patient. Second, our survey is susceptible to recall bias, which can impact VAS and moral distress scores because negative memories fade more quickly over time and the scores were affected by the mood of participants at the time of recall.[38,39] Third, the number of respondents who treated at least 1 OHCA/DNAR patient within the past 6 months was relatively small, which limited the power of statistical testing including multiple logistic regression analysis. Furthermore, while we adjusted for several known potential confounders, it's possible that other factors, such as clinician experience, workload, institutional practices or variances and culture, could influence the levels of emotional stress or moral distress. Lastly, the study findings reflect the experience and perspectives of participants who work in a single region in Japan. Therefore, it may not be generalizable to other regions or countries where different policies or practices are adopted.

Conclusions

This study demonstrated the majority of clinicians decided to apply "slow code" to OHCA/DNAR patients without ROSC in the ED. Major reasons for this included medical futility, absence of family at the time of patient arrival, and reluctance to stop resuscitation efforts immediately upon arrival. During or after treating an OHCA/DNAR patient, female clinicians and nurses were more likely to suffer from emotional stress and/or moral distress compared with male clinicians and physicians, respectively. Conducting "slow code" and unethical attitude toward "slow code" were associated with high stress. Further research is needed to protect clinician mental health and respect patient dignity, and thereby, improving the quality of patient care.

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CRediT authorship contribution statement

Ryo Tanabe: Conceptualization, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization, Project administration. **Takashi Hongo:** Conceptualization, Methodology, Validation, Investigation. **Takafumi Obara:** Conceptualization, Investigation. **Tsuyoshi Nojima:** Conceptualization, Investigation. **Atsunori Nakao:** Conceptualization, Writing – review & editing, Supervision. **Jonathan Elmer:** Conceptualization, Methodology, Writing – review & editing. **Hiromichi Naito:** Conceptualization, Investigation, Writing – review & editing, Supervision. **Tetsuya Yumoto:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Visualization, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

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