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Absence of Relatives Impairs the Approach of Nurses to Cardiopulmonary Resuscitation in Non-Cancer Elderly Patients without a Do-Not-Attempt-Resuscitation Order: A Vignette-Based Questionnaire Study

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A Do-Not-Attempt-Resuscitation (DNAR) order solely precludes performing cardiopulmonary resuscitation (CPR) following cardiopulmonary arrest. A patient's personal status is known to influence a range of clinical practices, not only CPR, when a DNAR order is given. We assessed whether the absence of supporting relatives or a diagnosis of dementia can influence nurses' perceptions of clinical practices for elderly patients with non-malignant and chronic diseases. A vignette-based questionnaire was used to evaluate nurses' beliefs both before and after issuance of a DNAR order. Three vignettes were developed: the *control* vignette described an 85-year-old woman with repeated heart failure, the second and third incorporated a lack of relatives and a dementia diagnosis, respectively. The survey assessed the approach of nurses to 10 routine medical procedures, including CPR, clinical laboratory testing and nursing care, using a 5-base Likert-scale, for six vignette scenarios. A questionnaire was completed by 186 nurses (64% response). The pre-DNAR *non-relative* vignette showed significantly lower scores for CPR, indicating a deterioration in willingness to perform CPR, compared to the pre-DNAR *control* (median [interquartile]; 3 [2-4] and 4 [3-4] in the *non-relative* and *control* vignettes, respectively, $p < 0.001$). No significant differences were observed between the *dementia* and *control* vignettes. Absence of contactable relatives and resultant lack of communication can diminish the perception of nurses regarding the provision of CPR, even when a DNAR does not exist. This result suggests a necessity for comprehensive training all medical staff about issuance of DNAR orders and what care should be provided thereafter.

Keywords: chronic disease; dementia; do-not-attempt-resuscitation order; family relationship; patient autonomy
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Introduction

A do-not-attempt-resuscitation (DNAR) order with regard to end-of-life care prevents healthcare professionals from performing cardiopulmonary resuscitation (CPR) on a patient, thereby respecting the patient's wishes in the event of cardiopulmonary arrest. In the United States, the Council on Ethical and Judicial Affairs (CEJA) of the

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American Medical Association (AMA) mandates that patients may express in advance their preference that CPR should be withheld, and this desire becomes legally authorized through issuance of a DNAR order (Council on Ethical and Judicial Affairs, American Medical Association 1991). The CEJA also mandates that the DNAR order should not affect administration of any other medical care but solely prohibits any attempt at CPR following cardiopulmonary arrest. In Japan, the issuance of DNAR orders has not been officially sanctioned (Nakagawa et al. 2017). Nevertheless, DNAR orders have been in common usage in Japanese hospitals, although few of those hospitals have developed in-hospital DNAR guidelines.

Despite the CEJA guideline, previous studies have shown that individuals who stipulated a DNAR order may receive less medical and nursing care than non-DNAR patients with a similar health status. Interventions such as antimicrobial therapy, blood transfusion, administration of pain medication and nutritional management have been reported to be negatively influenced by DNAR orders (Evans and Brody 1985; Katsetos and Mirarchi 2011; Hiraoka et al. 2016; Ethics Committee of Japanese Society of Intensive Care Medicine 2017a). Furthermore, the frequency of physical examinations, blood tests, and imaging studies was likely to be decreased among cancer patients after a DNAR order had been issued (Keenan and Kish 2000). Hospitalization and chemotherapy were also found to be withheld from such patients (Azad et al. 2014).

The primary focus of previous studies on DNAR orders has been in connection with intensive care or palliative care for patients with advanced cancer. Few studies have been performed on patients with non-malignant chronic illness such as cardiovascular and pulmonary diseases (Trivedi 2013; Wang et al. 2019). Patients with non-malignant chronic diseases experience longer periods of therapeutic interventions and more unpredictable prognoses than those undergoing intensive care or who have advanced cancer, resulting in them being more likely to change their mind about DNAR orders. These patients will probably have great difficulty making a definitive decision about a DNAR order.

A previous study by the present authors showed that the perceptions of nurses regarding CPR, defibrillation, and other medical procedures, such as blood examination and intravenous nutrition, for elderly patients with repeated heart failure could be influenced by the presence or absence of a DNAR order. This contravenes the DNAR order guidelines stipulated by the CEJA (Higuchi and Takita. 2018). The earlier analysis, however, did not assess whether the patient's background influenced the care given by nurses. In the present study, we focused on two important complicating factors for DNAR orders; whether a patient has supportive relatives, and whether a patient has had a diagnosis of dementia. These may impact the approach and actions of nursing staff, especially the presence and active support of relatives which are known to play an important role in end-of-life decision making (Hauke et al. 2011). In addition, another previous study demonstrated that physicians are more likely to agree to issue a DNAR order when a patient has been diagnosed with dementia (Ethics Committee of Japanese Society of Intensive Care Medicine 2017b). We hypothesized that the absence of relatives and a diagnosis of dementia could adversely influence nurses' approach to clinical practice after a DNAR order has been issued.

Healthcare professionals face a difficult dilemma deciding medical care for long-term elderly patients who have no supporting relatives and where there is no advance health care planning, given the limited decision-making ability of the patient and their possibly compromised mental status. In the present study, we investigated the influences of a lack of contactable relatives and a diagnosis of dementia on nurses' perceptions of clinical practices for elderly patients with non-malignant chronic disease, both before and after a DNAR order was issued. A vignette-based questionnaire survey was used, since vignettes allow direct comparison of the beliefs and actions of individual nurses in response to multiple and variable factors (Veloski et al. 2005).

Methods

Participants

We conducted a clinical vignette survey in 2018 at three community hospitals: a general hospital with 200 beds plus an 80-bed hospital (both containing general and recovery-phase rehabilitation wards) and a hospital with 180 beds containing general, recovery-phase rehabilitation, and long-term care wards. The hospitals were in rural areas where over 32% of the population were aged 65 years or older, which is higher than the national average of 26.6%. We distributed the questionnaire to all nurses (n = 292) at the three participating hospitals.

Development of vignettes

To develop the vignettes for this study and determine the clinical practices to be assessed, we held a group discussion with seven nurses working in the study location. The vignettes were developed to reflect representative patients hospitalized with non-malignant chronic diseases, including various patient characteristics previously determined to influence nursing care (Henneman et al. 1994; Fairman et al. 2011; Osinski et al. 2017; Wang et al. 2019). The following three vignettes were used in the survey. The *control* vignette, described an 85-year-old woman, living alone who was repeatedly hospitalized for acute heart failure and who had developed aspiration pneumonia. The vignette named '*non-relative*' contained the same information as the control, with the addition that the patient had no relatives to contact. Another vignette named '*dementia*' contained an episode of dementia in addition to the characteristics defined in the *control*.

We evaluated the impact of a DNAR order by creating

Table 1. Case Presentation of Vignettes.

Vignette	Case Presentation	
	Baseline	After DNAR
Control	*An 85-year-old woman, whose husband died 10 years ago, often says that she does not want to be taken care of by her child. Her hobby is doing handicraft with friends at an elderly club. One year ago, she was hospitalized due to the development of an acute myocardial infarction. She was hospitalized again three months ago due to a deterioration in her cardiac function.* *She has again been hospitalized due to acute heart failure. Her activities of daily living have declined, and her dietary intake decreased during her current hospitalization. On day 4 of her hospitalization, she developed aspiration pneumonia and her general condition worsened.* *She can communicate with others without disability, but she sometimes calls nurses repeatedly, saying that she feels restless and cannot get comfortable. She requires assistance for all activities of daily living. Her son and his wife, who live in the neighboring town, come to see her every other day. The family relationship is good. Her eldest grandson is planning his wedding in three months, and she is looking forward to it.*	The following episode was added to the end of baseline vignette. *One week after diagnosis with aspiration pneumonia, informed consent for a DNAR was obtained from her, her son, and her daughter-in-law. A DNAR order was written in the medical record.*
Non-Relative	The following description was replaced with underlined part of the control vignette. *She has had no relatives whom she can contact since the death of her younger brother, who was single, five years ago due to lung cancer.*	The following episode was added to the end of baseline vignette. *One week after diagnosis with aspiration pneumonia, informed consent for a DNAR was obtained from her. A DNAR order was written in the medical record.*
Dementia	The following description was added just after the first paragraph of the control vignette. *She has developed memory loss and was diagnosed with Alzheimer's dementia. She lived in a special nursing home in the same city before hospitalization.*	The following episode was added to the end of baseline vignette. *One week after diagnosis with aspiration pneumonia, informed consent for a DNAR was obtained from her son and her daughter-in-law. A DNAR order was written in the medical record.*

DNAR, do not attempt resuscitation.

two versions of each vignette: before and after the DNAR order had been issued (Table 1). Thus, we created two time periods for each of the three vignettes, making six scenarios in total.

Selection of clinical practices for assessment

A total of 35 types of clinical practices to best represent the care provided to elderly patients with non-malignant chronic diseases were listed, following on from group discussions with the nurses in the hospitals concerned. Considering previous studies (Henneman et al. 1994; Hiraoka et al. 2016), we selected 10 items (Table 2) covering common medical procedures (Q1-Q6 in Table 2) and nursing practices (Q7-Q10) determined by attending physicians and nurses. A 5-point Likert scale ('never perform' = 1, 'unlikely' = 2, 'neutral' = 3, 'likely' = 4, and 'always perform' = 5) was used to rate the perception of respondents concerning the application of items for each vignette. In addition, we collected personal data on each respondent, including age, gender, education level, years working in a hospital, years working in the current hospital (rounded down to the nearest year), frequency of caring for DNAR patients, knowledge of DNAR definition, and experience of DNAR.

Statistical analysis

Participants' characteristics were summarized with descriptive statistics. Subsequently, we compared the scores for the 10 clinical practices before the DNAR order between the three vignettes using Friedman's two-way analysis of variance by ranks, followed by the Bonferroni correction for post-hoc multiple comparisons. We then analyzed the scores post-DNAR order in the same way. Changes of the scores between pre- and post-DNAR order were also compared between the vignettes. The results were presented as medians and quartiles. p values under 0.05 were considered statistically significant. We considered the minimally important difference (MID) of the scores

Table 2. List of clinical practices evaluated in the survey.

Item Number	Clinical Practices for Evaluation
1	Perform cardiopulmonary resuscitation following cardiopulmonary arrest
2	Perform defibrillation during ventricular fibrillation
3	Perform a clinical laboratory test
4	Administer intravenous nutrition
5	Perform oxygen administration when SpO_2 is low and the patient is in respiratory distress
6	Palliative care of pain management, including anti-pain drugs and/or narcotic medication
7	Palliative nursing care, such as warming, cooling, and position changing
8	Increasing communication with patients and their families
9	Reporting changes of vital signs to attending physicians
10	Consultation about further medication and nursing care with registered nurse colleagues and/or other medical professionals

Participants responded on a 5-point Likert scale ('never perform' = 1, 'unlikely' = 2, 'neutral' = 3, 'likely' = 4, and 'always perform' = 5) for each of the clinical practices listed in the table after they read the vignettes.
SpO_2, peripheral oxygen saturation.

as a change of 1 or more in the median score (De Vet et al. 2011). Statistical analyses were performed using SPSS Statistics 25 (IBM Corp., Armonk, NY, USA).

Ethical consideration

Participants completed the questionnaire voluntarily after the they had provided informed consent, having been fully advised with respect to the purpose of study and the parameters governing data usage. The participants were not identified by name. This study was approved by the Institutional Review Board of the Minamisoma Municipal General Hospital (Fukushima, Japan) (Institutional approval number: 29-13). Permission to conduct the survey at the other two sites was obtained from the Directors of each individual hospital.

Results

Participant characteristics

A total of 186 nurses (64% response rate) responded to the survey. The respondent characteristics are shown in Table 3. The vast majority of the respondents were female (94%), with 33% of the respondents being 40-49 years of age. Almost all (97%) had experienced dealing with patients with a DNAR order in place, while only 12% had undergone any training of what to do in such circumstances.

Nurses' perception of clinical practices before DNAR order

Nurses' perceptions of the 10 selected clinical practices before a DNAR order was in place were compared across the three vignettes (Fig. 1A). A statistically significant decrease, with minimally important difference, was found in the score of CPR in the *non-relative* vignette, when compared to the control (median [interquartile]; 3 [2-4] and 4 [3-4] in *non-relative* and *control* vignettes, respectively, $p < 0.001$). No significant differences with MID in the median scores in the other clinical practices were found between the three vignettes. Of note, statistically significant, but small, decreases which did not reach MID in the average scores in *non-relative* vignettes were observed for defibrillation, blood test, intravenous nutrition, oxygen administration, increasing communication with patients and their families and consultation with colleagues ($p < 0.001$, 0.05, 0.05, 0.05, 0.001, and 0.05, respectively).

Nurses' perception of clinical practices after DNAR order

There were no differences in median scores of the post-DNAR order between the vignettes (Fig. 1B). A statistically significant, but small, decrease which did not meet the criteria of MID in the average scores in *non-relative* vignettes was seen in increased communication with patients and their families when compared to the control vignette ($p < 0.001$).

Change of scores between the baseline and post-DNAR order

The change of scores for selected clinical practices at post-DNAR order from the baseline was compared among the three vignettes (Fig. 2). In the *control* vignette, reduction of scores was seen in CPR, defibrillation, blood test and intravenous nutrition, while the other medical practices indicated no reduction. When compared to the *control*, the *non-relative* vignette showed less, but statistically significant, reduction in CPR and defibrillation ($p < 0.001$ for both).

Discussion

There is little understanding of how a patient's characteristics, notably absence of supporting relatives or a diagnosis of dementia, impact medical decision-making by healthcare professionals, particularly regarding elderly patients with non-malignant chronic disease. However, the importance of DNAR orders has become increasingly recognized among medical professionals as a means of ensuring patient autonomy, especially in countries with advanced

Table 3. Participants' characteristics (n = 186).

Variables	Value *n* (%)
Age	
20-29	47 (25)
30-39	38 (20)
40-49	61 (33)
≥ 50	40 (22)
Gender	
Female	174 (94)
Education level	
Nursing school	164 (89)
Bachelor's degree or higher (3-4 years)	21 (11)
Years of hospital experience (Mean (SD))	15 (10)
Years serving in current hospital (Mean (SD))	9 (9)
Experience caring for DNAR patients	
Never	6 (3)
At least once	177 (97)
Knowledge of DNAR order	
Yes ('*I know the definition of a DNAR order*')	134 (76)
Training about DNAR order received —Yes	22 (12)
Timing of training about DNAR order (multiple answers possible) —Undergraduate education	10 (5)
—Continuous medical education after graduation	16 (9)

Missing answers were found in a participant for *Education level*, and three for *Experience caring for DNAR patients*.
DNAR, do not attempt resuscitation.

health systems (Mello and Jenkinson 1998; van Delden et al. 2006). Our results deepen this understanding. We found that a lone patient, devoid of any support from relatives or others, may adversely affect the approach of nurses to CPR provision, even before the presence of a DNAR order.

Our results showed that, before a DNAR order, patients without relatives may be likely to have CPR withheld, in addition to the likelihood of less defibrillation, blood testing, intravenous nutrition, oxygen administration, and a decrease in communication with the patient concerned, their families and with work colleagues. The median score for CPR in the vignette of both *control* and *dementia* was 4 (likely to perform) while that for the *non-relative* vignette was 3 (neutral), indicating the possibility of withholding CPR for patients who had no relatives to contact.

The finding that nurses may withhold clinical interventions from patients without relatives before a DNAR order was issued can be interpreted as follows. First, the nurses who participated in this study may have previously experienced many cases of patients without relatives and that the patients were provided with a lower degree of medical care compared to those with relatives. Second, the results may reflect a lack of training of nurses in the study sites. Third, the personal beliefs and values of participants may influence the results, *i.e.*, the belief that it is better to withhold certain medical treatments because elderly patients without relatives should not be recipients of intensive medical care. These interpretations, however, were not evident in this study. Consequently, future studies are necessary to determine the cause of the differences in the approach of nurses towards patients with differing social characteristics and mental abilities.

No significant differences were detected in the vignette of *dementia* compared with the *control*. This could be due to the fact that when responding to the *control* vignette, the participants may have already considered that the patient could have dementia as a result of their age. Thus, the participants may not have perceived any differences between the *control* and *dementia* vignettes.

Regarding scores after a DNAR order had been issued, our study showed that communication with patients and their families was less likely in the *non-relative* vignette. This result was almost certainly due to the obvious fact that there were no relatives to contact. There were no significant differences in other clinical practices between all the vignettes after a DNAR order had been issued.

Comparing the vignettes regarding pre- and post-DNAR changes, there was a higher degree of withholding of CPR and defibrillation in the *non-relative* vignette compared with the *control*. According to the results regarding CPR before a DNAR order shown in Fig. 1A, the median

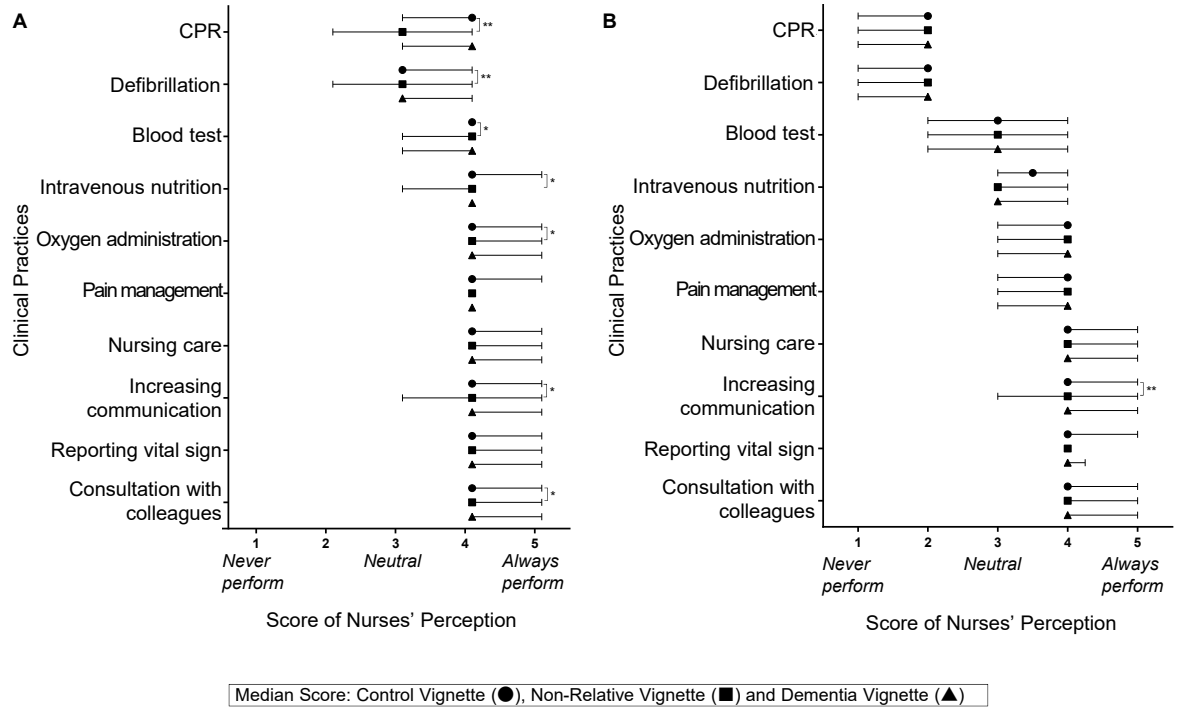

Fig. 1. Scores for nurses' perception for selected clinical practices before and after DNAR order.
Median scores (symbols) and the interquartile ranges (error bars) at baseline (A) and after DNAR order (B) are shown. The symbols of circle (●), rectangle (■) and triangle (▲) indicate the scores of vignettes for *control*, *non-relative* and *dementia*, respectively.
*$p < 0.05$ and **$p < 0.001$ for the comparison between vignette of *control* and *non-relative*.
Only willingness to give CPR showed a statistically significant decrease, with minimally importance difference in the *non-relative* vignette when compared to the *control*. No significant differences were found between the *control* and *dementia* vignettes.
CPR, cardiopulmonary resuscitation; DNAR, do-not-attempt-resuscitation.

score of CPR in the *non-relative* vignette was 'neutral,' whereas that for *control* was 'likely.' Considering the results at baseline before a DNAR order, CPR may be more likely to be withheld for patients who do not have any contactable or supportive family members, regardless of whether a DNAR order exists.

Our findings suggest that a lack of relatives with whom to communicate may affect clinical practices afforded to patients before a DNAR order. This raises concerns about an inadequacy in communication among healthcare professionals. To prevent such situations, nurses must be provided with comprehensive education and training with respect to end-of-life care. Consideration must also be given to the characteristics of long-term elderly patients, since a limited number of nurses participating in this study had been educated or trained in how best to respond in circumstances where a DNAR order was in existence. It is imperative that nurses, other medical staff, patients and their relatives all fully understand what is involved in the issuance of a DNAR order and what it means. Further, personalized care policies should be prepared, on a case-by-case basis, for patients without accompanying or contactable family members, since the patient may have unique values and wishes. Instead of allocating responsibility to individual healthcare professionals, relevant discussions should be made with patients, and multiple medical options based on the patient's opinions and wishes should be determined. The medical team must conduct timely evaluations, taking into account the thoughts and will of the patient, especially when the patient changes their mind or when their medical condition changes. Assessments based on the four principles of clinical ethics (Jonsen et al. 2011) – a patient's wishes, medical adaptation, quality of life, and surrounding circumstances – would be an effective means of governing such re-evaluations. It is necessary to ensure ethical justification regarding the withdrawal or diminishment of medical/nursing procedures, as such action may lower the quality of life of the patient and promote earlier death (Morrison et al. 1995).

There are several limitations to this study. First, the influence of DNAR orders on physicians' perceptions was not investigated. Further research is thus necessary to clarify the approach of physicians with respect to DNAR orders. Second, since the vignettes described virtual cases, the results may not represent real clinical practice. In future, qualitative studies incorporating real cases should be conducted. Third, participants' exact opinions regarding the procedures may not be reflected in the results due to the nature of survey, where the answer options were comparatively limited. Fourth, the vignettes concerning cardiac dis-

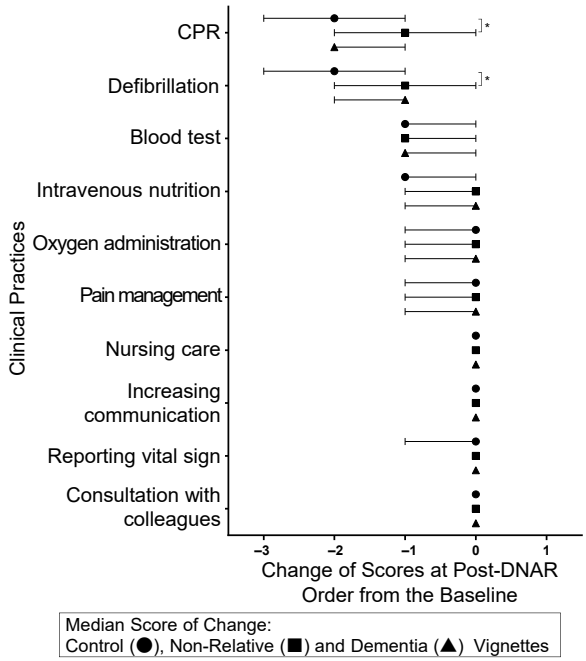

Fig. 2. Change of scores in nurses' perception after DNAR order issuance from the baseline.
Median scores (symbols) of changes after post-DNAR orders from baseline and the interquartile ranges (error bars) are shown. The symbols of circle (●), rectangle (■) and triangle (▲) indicate the scores of vignettes for *control*, *non-relative* and *dementia*, respectively.
*$p < 0.001$ for the comparison between vignette of *control* and *non-relative*.
No significant differences were found between the *control* and *dementia* vignettes.

ease may produce different results compared with vignettes focusing on respiratory or cerebrovascular diseases. Furthermore, the beliefs and approach of those participating may also have been influenced by the passage of time rather than the existence of a DNAR order, since the participants were informed that the second set of vignettes post-DNAR occurred a week after the baseline episode, ostensibly to best resemble real practice. Future research should use a randomized comparison with two vignettes differing only in the presence of a DNAR order.

In conclusion, our study demonstrated that the approach of nurses to the provision of CPR could be negatively affected before a DNAR order is issued when caring for long-term elderly patients who are not accompanied or supported by relatives and who have experienced repeated heart failure. Our findings suggest the need for proper education and training for nurses with regard to end-of-life care, especially care that is customized for dealing with long-term elderly patients. Furthermore, it is essential that comprehensive and early communication takes place, from the early stages, between all those concerned to help create and implement an optimal treatment plan for any given patient.

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Conflict of Interest

The authors declare no conflict of interest.

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