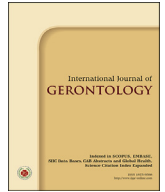




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Original Article

Factors Associated With the Do-Not-Resuscitate Decision Among Surrogates of Elderly Residents at a Nursing Home in Taiwan

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SUMMARY

Background: Do-not-resuscitate (DNR) in nursing homes is an emerging advance directive in Taiwan, but little research has been conducted. The purpose was to determine the factors associated with signing a DNR directive in the largest hospital affiliated nursing home in Taiwan.

Methods: A cross-sectional survey was conducted using a convenience sample from a nursing home in northern Taiwan between January 2011 and January 2012. The demographic characteristics of elderly residents were collected. 213 family surrogates of elderly residents were interviewed using a self-developed structured questionnaire related to DNR issues. The data were analyzed via descriptive statistics and logistic regression analysis.

Results: Only 24/213 (11.3%) of elderly residents had the DNR directives. Of these, 20/24 (83%) were made by family surrogates. The factors significantly associated with the DNR decision included the elderly residents had severe brain injury (OR: 8.83, $p = 0.023$), pulmonary disease (OR: 7.24, $p = 0.004$), cancer (OR: 5.20, $p = 0.045$); the family surrogates believe in Buddhism (OR: 8.02, $p = 0.030$), and ever having discussed DNR with the resident (OR: 19.23, $p < 0.001$). This model explained 49.4% of the variance in whether or not a resident had a DNR directive.

Conclusions: The findings indicated the DNR decision was associated with residents' conditions and surrogates' factors. These information are helpful to medical personnel in nursing homes to better understand and to assist the DNR decision-making process.

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1. Introduction

With a rapidly aging population in Taiwan, long-term care for the elderly has become a major challenge. According to official population projections, the elderly population will exceed 14% by 2018 and 20% by 2025.¹ Taiwan now has around 500 qualified nursing homes providing service for over 10 million person days per year.² Some degree of cognitive impairment is fairly common for most of the elderly residents,³ and a growing number of them die in nursing homes. As a result, unless a resident gives an advance directive, end-of-life care decisions often fall on family

surrogates.^{4,5} Therefore, the residents' end-of-life care and relevant decisions are important issues that must be addressed.

Do-not-resuscitate (DNR) is one of the most commonly discussed advance directives in nursing homes^{3,6}; DNR means refusal to accept cardiopulmonary resuscitation (CPR) when a patient suffers cardiac or respiratory arrest.^{6,7} As stated in the Taiwan's Hospice Palliative Care Act, the DNR can be signed by a competent terminally ill patient (DNR will) or by a close relative (DNR consent) when the terminally ill patient loses his/her capability. The sequence of legal family surrogates to sign DNR is spouse, adult children and grandchildren, parents, siblings, grandparents, great grandparents, great grandchildren, third-degree collateral relatives by blood, and first-degree direct relatives by marriage.⁸ At present, if residents in Taiwan's nursing homes do not have a DNR will or consent form, CPR will be administered and residents will then be transferred to emergency rooms at domestic hospitals for advanced

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treatment. Although CPR can prevent immediate death and prolong life for the elderly, the survival rate of discharge was only around 4% after CPR.⁹ The process may cause suffering, broken ribs, internal bleeding, neurological functional impairment, and diminished quality of life.^{7,10} Patients may need CPR repeatedly or pass away quickly.⁷

Making surrogate DNR decisions is a difficult task.^{11,12} Nevertheless, some studies of surrogate decision-making indicate that when family members make decisions on behalf of patients, the patients tend to receive a higher level of treatment.¹³ While DNR decisions inherently involve socio-cultural, religious, ethical, and legal issues, such decisions may also be affected by the characteristics of residents and surrogates as well as factors connected with medical personnel.^{6,7} However, many of the important factors related to DNR decisions for nursing home residents have not been examined.^{5,14} These factors include resident characteristics such as chronic disease, level of consciousness, payment sources, and number and type of tubes as well as surrogate characteristics such as a consensus among family members. The aim of this study was to determine the factors associated with the DNR decisions of elderly residents at the largest hospital-affiliated nursing home in northern Taiwan.

2. Materials and methods

2.1. Study design and participants

This study was a cross-sectional survey using a convenience sample from a nursing home in northern Taiwan. Inclusion criteria for this study were availability of family surrogates of elderly residents (≥ 65 years of age) and willingness to participate in this study. This study was approved by the Institutional Review Board of a hospital in northern Taiwan (99-3383B). The sampling frame during one year was 482. Questionnaires were distributed to family surrogates or used in a face-to-face interview conducted between January 2011 and January 2012. Of the 244 family surrogates eligible for this study, 31 refused to be interviewed.

2.2. Measurement

This study incorporated factors such as the elderly nursing home residents' overall health conditions, family surrogates' demographic characteristics and their understanding and opinions of DNR directives. Four instruments were used to collect data. First, a self-developed structured questionnaire obtaining demographic data (Tables 1 and 2) of the elderly residents and interviews with family surrogates to obtain an additional nine items related to DNR perspectives (Table 3). An interview was initiated while the family surrogates visiting their elderly relatives. The content validity of the instrument was evaluated by six experts on palliative care or geriatric care. Item-Content Validity Index (I-CVI) and Scale-CVI (S-CVI) were 1.0. The internal consistency estimated by Cronbach's α was 0.72. Second, the 10-item Barthel Index was used to judge the level of disability of elderly residents.¹⁵ Third, the 10-item Short Portable Mental Status Questionnaire (SPMSQ) developed by Pfeiffer was used to measure the level of cognitive defect in elderly residents and corrected by education level.¹⁶ Fourth, the Glasgow Coma Scale (GCS) developed by the neurological unit at the Institute of Neurological Sciences in 1986 was adopted to measure the level of brain injury of residents.¹⁷ The score of GCS and Barthel Index was obtained by reviewing residents' charts, while the score of SPMSQ was gathered by asking residents about ten questions using the SPMSQ scale. The dependent variable of DNR decision included the signing number of DNR will by residents and DNR

Table 1

The demographic characteristics of residents and surrogates (n = 213).

Variables	Residents	Surrogates
	n (%)	n (%)
Age (years)		
Range (Median)	65–104 (82)	30–82 (52)
Mean (SD)	80.2 (7.7)	51.6 (9.6)
<65 years	NA	198 (93.0)
65–74 years	40 (18.8)	12 (5.6)
75–84 years	100 (46.9)	3 (1.4)
≥ 85 years	73 (34.3)	0 (0.0)
Gender		
Male	92 (43.2)	110 (51.6)
Female	121 (56.8)	103 (48.4)
Marital status		
Single	3 (1.4)	26 (12.2)
Married	106 (49.8)	179 (84.0)
Divorced or widowed	104 (48.8)	8 (3.8)
Education		
\leq Elementary school	115 (54.0)	9 (4.2)
Junior high school	28 (13.1)	14 (6.6)
Senior high school	44 (20.7)	41 (19.2)
College & university	20 (9.4)	116 (54.5)
\geq Master	6 (2.8)	33 (15.5)
Religion		
No	31 (14.6)	51 (23.9)
Yes [†]	182 (85.4)	162 (76.1)
Buddhism	104 (48.8)	105 (49.3)
Taoism	69 (32.4)	54 (25.4)
Christianity	20 (9.4)	17 (8.0)
Catholicism	8 (3.8)	4 (1.9)
Other	3 (1.4)	3 (1.4)

Note.

[†] Multiple choice; NA, Not Applicable.

consent by family surrogates and was reviewed through residents' medical charts (Table 2).

2.3. Statistical analysis

The data were analyzed using SPSS 17.0 (SPSS Inc. Chicago, IL, USA). Logistic regression analysis was used to determine the factors associated with DNR decision for elderly residents in a nursing home. Following Hosmer and Lemeshow,¹⁸ characteristics of elderly residents and family surrogates with a $p \leq 0.20$ in bivariate analyses were entered into the multivariate model to create a parsimonious model. Omnibus test, $-2 \log$ likelihood, Cox and Snell R^2 , Nagelkerke R^2 , Hosmer and Lemeshow test, and overall percentage correct of the multivariate logistic regressions were compared to determine factors associated with DNR decision. Statistical significance was set at $p < 0.05$.

3. Results

Table 1 shows the demographic characteristics of the residents and family surrogates. The residents' ages ranged 65–104 years with an average of 80.18 ± 7.70 years. Family surrogates were between 30 and 82 years old with a mean age of 51.64 ± 9.57 . More than half of the family surrogates were male (51.6%) and married (84.0%).

Table 2 shows that the length of care service in the nursing home was between 0 and 106 months with a mean of 19.90 ± 23.31 months. The most common chronic diseases were hypertension (70.4%), followed by cardiovascular disease (57.7%). Only 11.3% of elderly residents had DNR signed by either residents ($n = 4$) or by family surrogates ($n = 20$).

Table 3 shows that the majority of family surrogates understood the contents of DNR (76.5%). Most family surrogates had never

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