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Posted Date: 24 May 2023

doi: 10.20944/preprints202305.1677.v1

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Exploring the Feeling Experienced by the Families of Terminally Ill Patients in Intensive Care Units When Signing Do-Not-Resuscitate Consent

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Abstract: All humans will experience the process of birth, old age, illness, and death. However, when faced with life-sustaining decisions, the families of patients are often faced with medical decisions as surrogates. In recent years, the families of patients have started to value the importance of the right to palliative care, although this often requires lengthy discussions. Therefore, this study explored the predictability of factors that affect the feeling experienced by patients' families when signing Do-Not-Resuscitate Consent. This study used a cross-sectional study and interviewed 90 family members using a structural questionnaire. The study hypotheses were tested using a t-test, one-way analysis of variance, product–moment correlation, and hierarchical regression analysis. Attribute variables of family members, such as gender and whether they live with the patient, are predictors that affect the family member's feeling experience when signing Do-Not-Resuscitate Consent. The emotional support from medical professionals to family members helps the family member to express their negative feelings on signing Do-Not-Resuscitate Consent; more informational support information provided to family members by medical professionals can alleviate negative feelings felt by family members when signing Do-Not-Resuscitate Consent. This study identified that family members' knowledge about Do-Not-Resuscitate acquired from medical professionals is relatively low. It is suggested that critical care units regularly conduct training on hospice palliative care, implement standard care procedures of hospice palliative care at critical care units, and provide detailed medical information about advanced decisions to family members so as to reduce their emotional stress. This will ensure that intensive care units can also achieve the goal of critically ill hospice palliative care.

Keywords: family members of terminally ill patients in intensive care units; feeling experience when signing Do-Not-Resuscitate Consent

1. Introduction

"Palliative care" or "Hospice care" are the care ideologies and methods that are valued and prevalent in many countries around the world. The care administered prioritizes the quality of life for patients near their end of life, rather than solely focusing on extending the duration of life. The World Health Organization (WHO) defined care subjects to be terminally ill patients and their families, with the goal of preventing and alleviating pain, and improving the quality of life of patients through the work of the medical team [1]. According to statistical data from the Ministry of the Internal in Taiwan, the number of people aged over 65 is 16.1% of the total population, as of December 2019. As the population ages and medical development advances, more and more people die of chronic diseases; patients in intensive care units are mostly elderly people. Patients in intensive care units are predominantly people aged over 65, and patients relying on ventilators are, on average, 72 years of age [2,3]. The concept of DNR has been popularized in Taiwan, but the perception of it is when treatment can no longer improve the patient's health condition and signing of Do-Not-

Resuscitate Consent is required, facing life sustaining topics, the primary decision maker's family members should be delegated to make the decision [4]. This study explored the attributes, social support, and knowledge that affect family members of patients in intensive care units when signing Do-Not-Resuscitate (DNR) Consent. The hope is to reduce invasive or painful medical treatments so that patients can receive hospice palliative care earlier. The family members of the patients would have time to give their thanks, apologies, love, and goodbyes, helping patients to maintain dignity at the last point of their lives, and finally, rest in peace.

Intensive care units (ICUs) are special medical care units that provide critically ill patients curative care with various frequencies of monitoring, and high-end medical equipment, and through mostly invasive treatments to maintain vital signs and physiological functions, in turn prolonging the life of critically ill patients. However, even with the most advanced medical technologies, there are still limits. When possible treatment methods have been undertaken but result in no avail, the patient's family members generally initially react with a mentality of "save him/her with all means." Over half of ICU patients are still under life-sustaining measures 24 hours prior to their passing. The measures include vasopressor, emergency cardiac medicine, external cardiac massage, invasive tube insertion, usage of ventilator to maintain life, antibiotic medication, drawing blood, tube feeding, etc. [3]. Therefore, it is important to provide patients and their families with care near the end of life; information about hospice palliative care can facilitate family members' communication and understanding, reducing anxiety, fear, and agony [5]. Through care instructions and psychological support, and the reduction in unnecessary invasive treatments, care that focuses on comfort is provided to patients and gives their loved ones the opportunity to pass on their thanks, apologies, love, and goodbyes genuinely.

Taiwan passed the Hospice Palliative Care Act in 2000, allowing terminally ill patients the right to choose not to administer cardiopulmonary resuscitation when disease is incurable, and their life is near the end. Research has indicated that in a medical center in Taiwan, of the patients suffering from eight major terminal illnesses, excluding cancer, only 24.1% of patients' family members signed DNR consent [6]. In a specific respiratory care ward, fewer than 40% of family members of patients on long-term ventilator usage had signed DNR consent [7]. A higher ratio of family members signing DNR consent can be associated with better legal knowledge about DNR, a more positive attitude toward hospice palliative care, marital status of single or divorced, patients with more severe disease, unconsciousness, more days hospitalized, more days using ventilators, and higher meal and hospitalization costs. Whether there are advanced directives is also a factor that affects medical decisions made by health care surrogates [8–10]. However, family members generally believe that if DNR consent is signed, treatments to the patients will decrease, and it feels like giving up on the patient, who will not be cared and treated to the maximum efforts. There is also fear that other relatives will say agreeing not to resuscitate is not complying to filial piety [11]. When signatories are faced with young children's death, psychological stress and the decision process is even more conflicted, swinging between "not letting the child suffer" and "seek any chance of revival." Medical teams should proactively offer family members information on the patient's condition, and listen and provide support timely to assist them when making suitable decisions [12]. Research in Taiwan indicated that when family members are faced with decisions on terminal conditions, advanced directives set by the patients can avoid difficult decisions [13]. Family members and loved ones can follow the patient's wishes and alleviate the heavy psychological stress placed on the family surrogates.

Social support can be classified into four types: tangible, emotional, informational, and appraisal support. Cohen and Syme hypothesize that tangible support mainly comes from spouses, children, parents, and siblings, and is the most direct and easiest to obtain; informational support is mainly provided by medical staff; emotional support is based on encouragement, tenderness, love, and emotion; and appraisal support is the degree to which one feels recognized and respected [14]. Chen et al. studied stress awareness and social support in parents of students with epilepsy, and found that through providing necessary information as education for sick children, such social support can help parents accommodate stress in life [15]. Related studies on feelings of stress, sleep deprivation, and exhaustion in primary caregivers in ICUs show that when sufficient social support is received, family members can better accommodate stress [16]. Studies from Taiwan and abroad indicate that the main caregiver in a family is predominantly female, and caregivers are usually under very high levels of stress, which affects their health conditions and quality of sleep. Psychological and physical health impacts from the quality of care are very damaging to caregivers and care receivers. Research indicates that more help received from neighbors, professional medical personnel, or family and friends can reduce the stress on caregivers, demonstrating the importance of social support [17].

2. Materials and Methods

2.1. Study Design and Participants

A cross-sectional study design was employed, with family members of terminally ill patients admitted into ICUs for over 24 hours as subjects. Purposive sampling was conducted to collect data, with the following criteria: (1) family members who consented to take part in the questionnaire investigation after the researcher had explained the purpose of the study; (2) those aged over 20 and were a blood relative to the patient (lineal relative or collateral blood relative), or families gained through marital relationship, such as a spouse, parents, children, descendants, or siblings; (3) those who could speak Mandarin or Taiwanese, and possessed elementary-school-level reading skills; and (4) those with complete legal capacity, with no apparent mental illness. When collecting data for the structural questionnaire, the first aspect was basic attributes of the family members (age, gender, level of education, religion, whether they lived with the patient, whether they were the main caregiver, and whether the patient made an advanced directive). The second part contained evaluation scales as research tools: “knowledge of signing the Do-Not-Resuscitate Consent among family members in the ICU,” “feelings associated with signing the Do-Not-Resuscitate Consent among family members,” and “Scale of social support to family members in the ICU.”

2.2. Measurement

Knowledge of signing Do-Not-Resuscitate Consent among family members in the ICU was ascertained using research performed by Yang et al. on patients’ family members’ knowledge about DNR; the questionnaire’s content was drafted and 10 questions were established, with an expert validity CVI of 0.94 and pilot research analysis result yielding a Cronbach’s α value of 0.77 [11]. Feelings associated with signing Do-Not-Resuscitate Consent among family members were assessed utilizing Chu’s self-composed caregiving family members’ feelings when signing DNR consent and formulated 8 questions, with an expert validity CVI of 1 and pilot research analysis result yielding a Cronbach’s α value of 0.88 [18]. The scale of social support to family members in the ICU adopted social support data from Wang et al., which had a Cronbach’s α value of 0.95, indicating that the scale has high stability. This result utilized the scale to compose questionnaire content and had an expert validity CVI of 0.98 and pilot research analysis result yielding a Cronbach’s α value of 0.91 [19].

2.3. Ethical Considerations

This study was reviewed and approved by the Institutional Review Board in the hospital, with an IRB number of 109-032-E. From June 1st to December 31st, 2020, 90 subjects who met the criteria were collected. The research subjects could contact the researchers at any time if they had questions, and it was the researchers’ obligation and responsibility to protect and respect the subjects’ privacy to ensure their personal data were absolutely classified. All the collected data were used for academic research analysis only, with absolutely no exposure to the public, clear adherence to research ethics, and protection of the research subjects’ right to privacy and personal information.

2.4. Data Collection and Analysis

SPSS 22 software was used to conduct statistical data analysis; descriptive statistics used percentages, averages, and standard deviations to describe distribution of basic information. In the inferential statistics aspect, the difference between family members’ knowledge and feelings on signing DNR consent and social support was analyzed through t-tests and one-way analysis of variance. The correlations between knowledge, feeling, and social support were analyzed with Pearson product moment correlation, and hierarchical regression analysis was used to analyze the predictability of feeling when signing DNR consent versus family member basic attributes, social support, and knowledge of DNR.

3. Results and Discussion

3.1. Analysis of attributes of family members in the ICU

In total, 90 subjects were collected in the study, with an average age of 50.8 ± 10.8; most subjects were between 41 and 60 years old (53 people, 77.8%). There were more males (57.8%) than females, and close to half of the subjects had a high school level of education (vocational high school) and junior college. Most (80%) of family members held religious beliefs, and the majority of them lived with the patients (57 people, 63.3%). There were 63 subjects who were the patients' primary caregiver (70%); only 31 subject's related patients had made advanced directives (34.4%); and most signatories were the patients' children (62 people, 68.9%).

3.2. Analysis of differences in the knowledge of DNR and family members' basic attributes

The study found that family members in the ICU are aware that signing DNR consent is the patient and family members' right, and that it means not to resuscitate at the end of the patient's life. This showed that Taiwanese nationals have generally gained relevant information about hospice palliative care under the promotion of the government. The most unclear indication was that when signing DNR consent, it signifies family members to prepare for funeral arrangements. This echoes research performed by Tang et al., which indicated that, clinically, the chosen timing of communication about DNR is often when illness conditions change or become critical [20]. Regarding the way medical teams convey clinical conditions, family members of patients felt that if they can be more direct, and be as clear as possible about the condition, it will allow them to better prepare for subsequent arrangements [21].

The signatory family members in this study were, on average, 50.8 ± 10.8 years old, with an age range of 26–72 years old and the majority aged between 41 and 60 years old (53 people, 77.8%), according to Table 1. Over half of the signatories were male. In Chinese culture, when faced with important decisions, the main decision maker in the family is still mostly adult males, especially the sons [22]. Half of the subjects in this study had a high school level of education (vocational high school) and junior college. Chen et al. hypothesized that the level of education is an important factor versus the knowledge of signing DNR consent. They suggested that those with a higher level of education can become exposed to educational knowledge about hospice palliative care through seminars or online platforms, in turn affecting their knowledge and willingness of signing DNR consent [23]; scholars worldwide believe that effects of promoting DNR is related to knowledge, the main factor being the level of education and culture of patients and their family members, resulting in incomprehension and unacceptance of the matter. This study found that level of education did not affect the knowledge of DNR among family members, because the subjects had already signed DNR consent. During the investigation, it was found that family members still did not very clearly understand the content of DNR, but may have signed it hoping to reduce pain for the patients. Wu's research indicated that up to 90% of family members in the ICU have heard of DNR, but did not have complete knowledge [24]. This study achieved results similar to Yang et al., i.e., family members' gender, religious beliefs, whether they lived with the patients, whether they were the main caregivers, or if advance directives were made which did not affect their knowledge of DNR [11]; some research indicated that Buddhism and Taoism religious backgrounds of patients, marital status, and diagnosis upon admission could all affect the knowledge of DNR, which was different from the results of this study [25].

Chen et al. showed that children possess more legal knowledge about hospice care compared with spouses, indirectly proving that parents have even less knowledge about hospice care than spouses [26]. This study found that when signatories were parents of terminally ill patients, their knowledge of DNR was less than other relatives such as children and spouses. This could be due to the parents being older; not fully understanding the medical technology and ideology mentioned in the foreword, causing the meaning of DNR to be unclear; avoiding discussions of death-related topics, etc. Additionally, when faced with their children's lives, more parents would hold the hope of taking more life-sustaining measures in order to save their lives. The differences between past studies may be due to the subjects of the study, questionnaire design, study timeframe, etc.

Table 1. Analysis of differences in family members' basic attributes on the knowledge of DNR (n = 90).

Variables		**N**	**Average**	**SD**	**t/F**	***p* value**	**Scheffe's Posterior Comparisons**
Gender	Male	52	8.85	1.775	1.376	0.172	
	Female	38	8.32	1.847			
Level of education	(1) Elementary/Junior high school	10	8.7	2.111	0.991	0.375	
	(2) High school(vocational)/junior college	43	8.35	1.975			
	(3) University/graduate school	37	8.92	1.516			
Religious beliefs	None	17	7.94	2.193	−1.737	0.086	
	Yes	73	8.78	1.694			
Lived with the patient	No	33	8.39	1.58	−0.907	0.367	
	Yes	57	8.75	1.939			
Is the primary caregiver	Yes	63	8.7	1.863	0.606	0.546	
	No	27	8.44	1.717			
Did the patient have advanced directives?	Yes	31	8.97	1.315	1.315	0.192	
	No	59	8.44	1.47			
Relationship to the patient	(1) Parents	7	6.43	2.44	4.229 **	0.004	(2) > (3) > (1)
	(2) Spouses	14	9.5	1.286			
	(3) Children	62	8.74	1.727			
	(4) Siblings	3	7.67	0.557			
	(5) Other relatives	4	8.25	1.258			

Note: $^{**}p < 0.01$.

3.3. Analysis of differences in feelings when signing DNR and family members' basic attributes

This study found that most negative emotions seen in the questions of the scale "feelings associated with signing the Do-Not-Resuscitate Consent among family members" were: "I feel fear because the patient could be lost at any time", with an average score of 2.12; second was feeling pain because "I could not let go of the patient", with an average score of 2.08; and the lowest score of negative emotion was guilt towards the patient, with an average score of 1.60, as shown in Table 2. This is similar to the results from Lin, who studied the emotional journey of family members of terminally ill patients who signed DNR consent [27]. This study found that negative emotions felt after signing DNR were regret, guilt, uncertainty, powerlessness, and sadness. This study showed that, when terminally ill patients in the ICU were nearing the end of their lives, if family members lived with the patients or were the primary caregiver, they experienced more negative feelings after signing DNR consent, which was similar to the results of Chu [18]; research on the psychological stress of family caregivers of cancer patients found that they experience a series of complex emotions such as helplessness, anxiety, depression, and uncertainty, etc., because they are family [28]. Other studies found that surrogate DNR decisions can result in negative emotions and psychological conflicts, causing feelings of hesitation [29]. Caregivers who spent a longer time caring for patients and who lived with the patients, when faced with the patients' illnesses, especially in the ICU when facing the progress of their family member's change in condition and life and death situations, in addition to physical and psychological agony of the possibility of losing their family members, and being responsible for major medical decisions, could experience greater feelings and emotions [30–32]. This study collected subjects in the Greater Hsinchu area with family members aged between 26 and 72 years old, and a level of education above junior high school and college. At the same time, the concept of hospice palliative care became widespread through the last 10 years of promotion, and information related to hospice care can be obtained through the Internet and diverse methods; thus, there was no significant correlation to the feelings when signing DNR consent. The results were different from the research by Hsu which indicated that age, the level of education, and relationship to patients will affect emotions [33]. This could be related to the number of samples collected and differences in the level of education in different geographical areas.

Table 2. Analysis of differences in family members' basic attributes on the feelings when signing DNR consent (n = 90).

Variables		N	Average	SD	t/F	*p* Value
Gender	Male	52	14.42	4.896	−1.335	0.185
	Female	38	15.84	5.097		
Level of education	Elementary/junior high school	10	15.1	4.433	0.014	0.986
	High school (vocational)/junior college	43	14.93	4.793		
	University/graduate school	37	15.11	5.491		
Religious beliefs	None	17	15.18	4.927	0.14	0.889
	Yes	73	14.99	5.054		
Lived with the patient	No	33	12.39	4.867	−4.118***	.000
	Yes	57	16.54	4.452		
Is the primary Caregiver	Yes	63	15.75	4.239	2.138*	.035
	No	27	13.33	6.214		
If the patient had Advanced directives	Yes	31	14.55	5.971	−0.649	0.518
	No	59	15.27	4.448		
Relationship to the patient	Parents	7	11.43	4.315	1.559	0.193
	Spouses	14	16.64	4.893		
	Children	62	15.24	5.072		
	Siblings	3	14.33	1.528		
	Other relatives	4	12.75	5.123		

Note: * $p < 0.05$; *** $p < 0.001$.

3.4. Analysis of differences in social support and family members' basic attributes

This study utilized the 16-question social support scale developed by Wang in 1998, which referred to Cohen and Syme [14]. This study found that the average score of the 16 questions in the social support scale for family members was lower than the average score for medical professions. This is different from Liu's result on social support of elderly family members of patients in critical units [34]. This could be due to the average age of subjects in this study being 50.8 years, and had more frequent contact and communication with the medical team, which led to the differences in results. Of the 16 questions in the social support scale, the first 4 questions concerned emotional support, questions 5~8 regarded informational support, questions 9~12 focused on appraisal support, and questions 13~16 considered tangible support. This study found that in terms of social support, signatory family members received higher appraisal support, but rather low tangible support. Support from family and friends was highest in emotional support and lower in informational support; support from medical professionals was higher in informational and appraisal support, with tangible support being the lowest. The result is similar to other studies in Taiwan, such as Sun et al., who studied 91 subjects in a medical center who were the primary caregivers of stroke patients and who used to live together [35]. The study found that, in terms of social support, emotional support had the highest score and tangible support had the lowest score. Chen et al. explored the source of social support to parents of children with epilepsy, and found that tangible support mostly came from family, informational support came from professional personnel, and that emotional support mainly came from family [15].

The social support from medical staff and family and friends was analyzed, as shown in Table 3 and Table 4. First, the difference in family members' education level and received tangible support and the social support provided by medical staff were assessed. If the level of education was university/graduate school, then tangible support from medical professionals is higher. The reason could be that family members with a higher level of education can receive tangible assistance more easily, such as seeking resources when faced with financial difficulties, adjusting visitation and accompanying times, etc. The result is similar to Tsai, who found that between the university/graduate school and high school levels of education, the reception of social support by those with university/graduate school education is higher [36]. This is also similar to the results of Ho's study, who found that tangible support for primary caregivers with a university level of education was higher than those with high school education [37]. Primary caregivers are mostly family members who live with the patients. When faced with an unfamiliar environment in the ICU and its restrictions, or a financial crisis caused by medical cost, unoptimistic prognoses and family members nearing the end of life cause very high stress [38,39]. During the time in hospital, family members receive more emotional support, informational support, and appraisal support from medical staff; if the signatory family members are primary caregivers, more emotional support is received from medical staff during visitation, which is the same social support results from the study by Chen et al. on parents of children with epilepsy [15]; when patients had advanced directives, regardless of oral or written, it helps medical professionals to discuss illness conditions and subsequent treatment directions with family members. More emotional support and positive appraisal support would be received during the decision-making process, such as greater clarity when the medical team communicates with family members on treatment directions [13], providing family members and patients with psychological and emotional support, providing tangible support such as early hospice care intervention, etc., to reduce their burden and support them psychologically.

When analyzing basic attributes and social support from family and friends, the main impacting attributes are the level of education, religious beliefs, and whether they lived with the patients and if the patients made advanced directives. This study found that age does not affect the social support results by family and friends, which is different from the findings of Cheng et al., who indicated that caregiver family members of older two-generation families had lower tangible support [40]. This study further found that, similar to research by Ho, family members with a university/graduate school level of education had a higher proportion of seeking other family members' assistance due to their own abilities, leading to more tangible support received when compared with those with an elementary/junior high school level of education [37]. Lin indicated that those with religious beliefs can accommodate and adjust better than those without religious beliefs, similar to the results in this study that family members with religious beliefs could feel more positive appraisal support from family and friends [41]. Family members who lived with the patients received more care, encouragement, and assistance from other family and friends, no matter the emotional, appraisal, or tangible support aspects. This study also found that family members of patients with advanced directives could allow other family members to receive enough information to reach a consensus within the family, and more positive appraisal support to receive more understanding and forgiveness. Studies within Taiwan showed that when faced with decisions of terminal illnesses, patients with advanced directives can avoid difficult decisions [13], and studies worldwide showed that the advanced directive is to allow family and friends to understand and follow the will of the patients [42]. Moreover, related research indicated that, by attending family consultations for palliative care, the family members would have a chance to be involved in the end-of-life care and treatment discussions, in turn helping family members to receive all aspects of support during the period in which they signed DNR [43].

Table 3. Analysis of differences in family members' basic attributes on social support from medical staff (n = 90).

Family members' basic attribute variables		Emotional Support			Informational Support			Appraisal Support			tangible Support			
		M (*SD*)	*t*/*F*	*p*	*M* (*SD*)	*t*/*F*	*p*	*M* (*SD*)	*t*/*F*	*p*	*M* (*SD*)	*t*/*F*	*p*	Scheffe
Age	(1)	9.82 (1.704)	1.377	0.258	10.41 (1.502)	0.263	0.769	10.82 (1.551)	1.427	0.246	8.76 (2.278)	3.165*	0.047	(1) > (3)
	(2)	9.55 (2.015)			10.06 (1.936)			9.94 (2.116)			8.06 (2.692)			
	(3)	8.85 (1.785)			10 (2.176)			9.95 (1.669)			6.8 (1.852)			
Gender	Male	9.35 (1.867)	0.101	0.573	10.1 (1.729)	0.921	0.931	10 (1.715)	1.492	0.528	7.85 (2.2)	1.195	0.776	
	Female	9.58 (2.009)			10.13 (2.146)			10.26 (2.226)			8 (2.922)			
Level of education	(1)	8.5 (2.273)	2.277	0.109	9.4 (2.633)	0.794	0.455	9.1 (2.885)	1.551	0.218	6.9 (2.998)	4.763*	0.011	(3) > (2)
	(2)	9.3 (1.753)			10.23 (1.837)			10.26 (1.72)			7.35 (2.458)			
	(3)	9.86 (1.946)			10.16 (1.772)			10.22 (1.858)			8.84 (2.192)			
Religious beliefs	None	9 (2.031)	0.179	0.292	9.94 (1.56)	1.998	0.685	9.71 (2.201)	1.446	0.342	8 (2.806)	0.585	0.873	
	Yes	9.55 (1.893)			10.15 (1.984)			10.21 (1.878)			7.89 (2.464)			
Lived with the patient	No	10.3 (1.686)	0.088***	0.001	10.79 (1.386)	8.541**	0.01	10.82 (1.53)	3.861**	0.008	8.91 (2.542)	1.045**	0.004	
	Yes	8.95 (1.884)			9.72 (2.059)			9.7 (2.044)			7.33 (2.332)			
Is the primary caregiver	Yes	9.11 (1.91)	0.14*	0.011	9.9 (1.99)	0.69	0.117	9.86 (2.007)	0.868	0.057	7.89 (2.476)	1.102	0.899	
	No	10.22 (1.739)			10.59 (1.623)			10.7 (1.66)			7.96 (2.653)			
If the patient had advanced directives	Yes	10.13 (1.928)	0.063*	0.013	10.35 (1.684)	0.232	0.382	10.35 (1.907)	0.057	0.391	9.03 (2.345)	0.027**	0.002	
	No	9.08 (1.832)			9.98 (2.013)			9.98 (1.961)			7.32 (2.417)			
Relationship to the patient	(1)	9.14 (1.574)	0.855	0.495	10.71 (1.38)	0.745	0.564	10.14 (1.574)	0.765	0.551	8.71 (3.592)	1.409	0.238	
	(2)	8.64 (2.307)			9.57 (2.593)			9.29 (2.758)			6.71 (2.758)			
	(3)	9.61 (1.867)			10.19 (1.809)			10.26 (1.727)			7.98 (2.315)			
	(4)	10 (1.732)			10.67 (2.309)			10.33 (2.887)			8 (2.646)			
	(5)	9.75 (2.062)			9.25 (0.957)			10.5 (1.915)			9.5 (1.915)			

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. 1. Age: (l) 18–40 years old, (2) 41–60 years old, (3) 61–80 years old; 2. Level of education: (1) elementary/junior high school, (2) high school(vocational)/junior college, (3) university/graduate school; 3. Relationship to the patient: (1) parents, (2) spouses, (3) children, (4) siblings, (5) other relatives.

Table 4. Analysis of differences in family members’ basic attributes on social support from family and friends (n = 90).

Family members’ basic attribute variables		**Emotional Support**			**Informational Support**			**Appraisal Support**			**Tangible Support**			
		***M* (*SD*)**	***t*/*F***	***p***	***M* (*SD*)**	***t*/*F***	***p***	***M* (*SD*)**	***t*/*F***	***p***	***M* (*SD*)**	***t*/*F***	***p***	**Scheffe**
Age	(1)	9.82 (2.215)	0.79	0.45	7.88 (3.039)	0.082	0.921	10.18 (1.51)	1.309	0.28	9.47 (2.478)	4.48*	0.014	(1) > (2) > (3)
	(2)	9.64 (2.288)			8.09 (2.404)			9.09 (2.42)			9.17 (2.392)			
	(3)	8.9 (3.259)			7.85 (2.943)			9.25 (2.954)			7.3 (3.13)			
Gender	Male	9.69 (2.356)	0.552	0.427	7.98 (2.453)	2.441	0.936	9.27 (2.206)	2.686	0.77	8.94 (2.227)	3.7	0.591	
	Female	9.26 (2.728)			8.03 (2.88)			9.42 (2.718)			8.63 (3.233)			
Level of education	(1)	8 (3.3)	2.52	0.086	7.6 (3.239)	0.966	0.385	8.7 (3.368)	2.491	0.09	6.7 (3.561)	5.75**	0.004	(3) > (1)
	(2)	9.47 (2.613)			7.7 (2.435)			8.91 (2.486)			8.56 (2.771)			
	(3)	9.97 (2.021)			8.46 (2.673)			10 (1.915)			9.68 (1.901)			
Religious beliefs	None	8.59 (3.124)	1.435	0.093	7.12 (3.1)	0.32	0.125	8.24 (3.052)	2.113*	0.037	8.65 (2.914)	0.02	0.781	
	Yes	9.73 (2.323)			8.21 (2.483)			9.59 (2.197)			8.85 (2.649)			
Lived with the patient	No	10.21 (2.382)	0.023*	0.043	8.58 (2.829)	0.602	0.114	10.18 (2.27)	0.000*	0.011	9.7 (2.812)	2.91*	0.016	
	Yes	9.11 (2.519)			7.67 (2.466)			8.84 (2.389)			8.3 (2.493)			
Is the primary caregiver	Yes	9.4 (2.587)	0.183	0.513	7.81 (2.47)	1.262	0.296	9.21 (2.477)	0.009	0.45	8.71 (2.654)	0.75	0.604	
	No	9.78 (2.359)			8.44 (2.953)			9.63 (2.306)			9.04 (2.79)			
If the patient had advanced directives	Yes	9.94 (2.449)	0.013	0.248	8.84 (2.162)	1.267*	0.027	10.1 (2.039)	0.875*	0.029	9.45 (2.908)	1.36	0.101	
	No	9.29 (2.54)			7.56 (2.756)			8.93 (2.525)			8.47 (2.521)			
Relationship to the patient	(1)	8.29 (3.773)	0.713	0.585	7.43 (3.359)	0.612	0.655	8.57 (3.91)	0.725	0.58	8.43 (4.077)	0.67	0.614	
	(2)	9.07 (2.556)			8 (2.717)			8.86 (2.878)			7.93 (2.841)			
	(3)	9.74 (2.381)			8.15 (2.468)			9.55 (2.148)			8.95 (2.531)			
	(4)	9 (3)			8.67 (2.082)			8 (2)			9.33 (2.309)			
	(5)	10 (1.826)			6.25 (4.193)			10 (2.309)			10 (2.309)			

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. 1. Age: (l) 18–40 years old, (2) 41–60 years old, (3) 61–80 years old; 2. Level of education: (1) elementary/junior high school, (2) high school(vocational)/junior college, (3) university/graduate school; 3. Relationship to the patient: (1) parents, (2) spouses, (3) children, (4) siblings, (5) other relatives.

3.5. Predictability analysis of feelings when signing DNR consent on family member basic attributes, social support, and knowledge of DNR

Predictability analysis of feelings when signing DNR consent versus family member basic attributes, social support, and knowledge of DNR is shown in Table 5. Whether one lived with the patient, gender, informational support, and emotional support from medical staff are predictability factors that affect feelings when signing DNR consent. The variables are discussed in the following section.

3.5.1. Lived with the patients

Study results and research from within and outside of Taiwan all showed that most primary caregivers are family members that live with the patients. When the caregiver is the spouse, there is a responsibility to care for the family, and they are thus susceptible to more anxiety; due to long periods of caring for the patient, the caregiver can experience fatigue, insomnia, decrease in stamina, etc., and psychologically develop negative emotions such as frustration, sadness, anger, and depression [15,17,30,31,44].

3.5.2. Gender

This study yielded similar results to Lin et al., McAdam et al., and Paek et al., who all found that primary caregivers are predominantly female, and indicated that female primary caregivers are more susceptible to care burdens and experience emotional stress issues due to prolonged care requirements; research also indicated that of family members in the ICU, young females tend to feel more stress than males [6,45,46].

3.5.3. Informational support from medical professionals

The results from this study corroborate foreign research which indicated that family members in critical units wish most for medical professionals, through meetings and discussions, and provide more information about the patient's condition and treatment results [47,48]. The result also corroborates research within Taiwan which supports the function that mostly family members receive informational support from medical professionals [15,49].

3.5.4. Emotional support from medical professionals

This study found the same result as Wu, showing that medical professionals are important support characters that provide emotional care and discussions on caring requirements and burden. Sufficient emotional support can reduce the overall stress felt by family members [50]. Therefore, the more emotional support medical professionals can provide to caregivers, through companionship, listening, release of stress, and empathy, the more family members' psychological burden and stress can be reduced.

In summary, in the aspect of feelings among family members when signing DNR consent, medical professionals may face family members for a short period of time; more care and listening should be provided to family members because signatories are predominantly those who lived with the patients. It has been suggested female family members have more sensitive psychological emotions than males, and thus may require more support in companionship and emotional comfort; social support does impact the feeling of stress experienced by family members when signing DNR consent; therefore, emotional support from family and friends and medical professional can help them express negative emotions throughout the decision-making process. By providing care, support, companionship, and empathy, family members can release their negative emotions; during the treatment and decision process, medical professionals can provide family members with information that helps them understand the changes in patients' conditions, allowing them to be involved in the decision-making process of their loved ones, and alleviate negative emotions experienced by family members.

Table 5. Hierarchical regression analysis of feelings when signing DNR consent on family members' basic attributes, social support, and knowledge of DNR (n = 90).

	Feelings when signing DNR								
Model	**Model 1**			**Model 2**			**Model 3**		
Variables	**β**	**T**	***p***	**β**	**T**	***p***	**β**	**T**	***p***
(Constant)		0.877	0.383		1.062	0.292		1.032	0.306
Age	−0.118	−0.877	0.383	−0.178	−1.276	0.206	−0.183	−1.285	0.203
Gender	0.229	2.261*	0.026	0.222	2.231*	0.029	0.223	2.225*	0.029
Level of education	0.022	0.174	0.862	−0.049	−0.392	0.696	−0.051	−0.406	0.686
Religious beliefs	0.010	0.103	0.918	−0.042	−0.404	0.688	−0.046	−0.432	0.667
Lived with the patient	0.423	3.837**	0.000	0.429	3.720**	0.000	0.426	3.623**	0.001
Is the primary caregiver	−0.098	−0.908	0.367	−0.105	−0.963	0.339	−0.105	−0.951	0.345
If the patient had advanced directives	0.012	0.121	0.904	0.061	0.574	0.568	0.064	0.588	0.558
Relationship to the patient	0.060	0.509	0.612	−0.023	−0.199	0.843	−0.028	−0.232	0.817
Emotional support from family and friends				0.225	1.272	0.207	0.223	1.253	0.214
Informational support from family and friends				−0.001	−0.006	0.995	−0.003	−0.020	0.984
Appraisal support from family and friends				−0.022	−0.130	0.897	−0.026	−0.152	0.880
Tangible support from family and friends				−0.025	−0.151	0.880	−0.027	−0.160	0.873
Emotional support from medical professionals				0.326	2.161*	0.034	0.327	2.150*	0.035
Informational support from medical professionals				−0.356	−2.138*	0.036	−0.363	−2.127*	0.037
Appraisal support from medical professionals				−0.019	−0.093	0.926	−0.009	−0.045	0.964
tangible support from medical professionals				−0.012	−0.084	0.933	−0.009	−0.068	0.946
Knowledge of DNR							0.023	0.211	0.833
R2		0.243			0.380			0.381	
F		3.257			2.799			2.603	
△R2		0.243			0.137			0.001	
△F		3.257			2.015			0.045	
p		.003			.056			.833	

Note: * $p < 0.05$; ** $p < 0.01$.

4. Conclusion

Based on the results of this study, the following points can be concluded: when the family member's relationship to the patient was a "spouse," the knowledge of DNR scored more highly than that of other family members. In Taiwanese culture, spouses are designated by the family to be the main decision makers, and play a core role during explanations the condition; thus, they would receive more information on DNR. If the family members live with the patients and are the primary caregivers, a higher level of negative emotions will be produced when signing DNR consent.

The family members who signed DNR consent and were between the ages of 18 and 40 with a university/graduate school level of education received the most tangible support from medical professionals; family members who lived with terminally ill patients could feel and receive more emotional, informational, appraisal, and tangible support from medical professionals; if the family members were primary caregivers, they could feel more emotional support from medical professionals during visitations; when family members were aware of advanced directives by the patients, it helps them discuss the patients' conditions and subsequent treatment directions with medical professionals, thus receiving more emotional and tangible support during the decision-making process.

The family members who signed DNR consent and were between the ages of 18 and 40 and with a university/graduate school level of education understood their requirements and received tangible support from family and friends more easily; those with religious beliefs received more appraisal from family and friends; the family members who lived with terminally ill patients receive relatively less informational support from family and friends; family members informed that the patient had advanced directives could allow other family members to receive enough information to reach a consensus within the family, and more positive appraisal support to receive more understanding and forgiveness.

Hierarchical regression analysis of the predictive factors of feelings among family members in the ICU who signed DNR showed that predictive factors which affect overall score of feelings include whether one lived with the patient, gender, and informational and emotional support from medical

doi:10.20944/preprints202305.1677.v1

professionals. Of the family members who signed DNR consent, if they lived with the terminally ill patients, especially if they were females, were more susceptible to emotional impacts. Through emotional support from medical professionals, providing care to family members who signed DNR consent could allow them to express sad and negative feelings. Informational support from medical staff could also reduce negative emotions felt by family members who signed DNR consent. Thus, through condition explanations by medical professionals and providing suitable care, negative emotions felt by family members who signed DNR consent could be reduced.

5. Recommendations

5.1. Nursing Practice

Hospice palliative care has been implemented for many years in Taiwan, and the concept of DNR is now widespread. However, research found that it is mostly family members who signed DNR, and their knowledge of DNR is that they should only sign when the illness can no longer improve from treatments. During the signing process, family members often face struggles and considerations, including uncertainty of the patients' will, impact and stress from cultural backgrounds, and filial duties. This study found that considering the knowledge and emotions felt by family members when signing DNR consent at the end of their family members' lives, support from medical professionals and family and friends can alleviate their stress and burden during the process. A recommendation and care for family members of patients in the ICU who signed DNR consent is presented below.

Family members need to acquire sufficient information. When faced with decisions for terminally ill patients, family meetings with the patients and family members as centers can be conducted to understand whether the patient had made advanced directives and will. By conducting family meetings, opinions within family and friends can be communicated and integrated, and sufficient support can be provided to high conflict groups, reducing the impact and negative feelings during the decision-making process, producing joint decisions to meet the requirements of the patient and family members in the end-of-life period.

The knowledge of DNR should be strengthened among family members. When faced with decisions, the minds and focus of family members can often not concentrate. Doctors may explain the purpose of signing DNR consent, but often find that family members do not have a consistent degree of understanding. It is recommended that nursing staff should evaluate the knowledge of DNR among family members during visitation and provide additional explanations when required.

At the end of a patient's life, medical professionals should join with hospices to share care nurses as routine and conduct palliative care consultations with the patient and family members to discuss advanced directives and face the topic of death, providing information on hospice palliative care regulations, and communicate and coordinate the utilization of social resources, in turn alleviating psychological stress of family members.

The support medical professionals provided to family members should be strengthened. When studying the knowledge of signing DNR received by family members, this study found that informational support received from family and friends was higher than that from medical professionals, indicating that business of clinical duty caused the lack of information provided by nursing staff. The frequency and duration of contact with family members can be increased, and professional training can strengthen this area.

The "Five Whole" and "Four Principles" of hospice palliative care ideology of critical illness hospice care should be implemented. By developing whole-person, whole-family, whole-process, whole-team, and whole-community care, albeit not accelerating nor delaying the occurrence of death, it is hoped that patients and family members can genuinely give their thanks, apologies, love, and goodbyes, ensuring that no regrets transpire after a patients' passing [51].

5.2. Nursing Education

The results of this study show that family members need repeated explanations from medical professionals in order to acquire adequate knowledge on DNR. Thus, the units should host annual hospice palliative-care-related training and encourage staff members to attend online hospice palliative care courses. It is hoped that, through training, the nursing staff of intensive care units can enhance their knowledge on hospice palliative care, understand the difference between advanced directives and hospice palliative care, and in turn clarify questions and emphasize the importance of hospice care in critical illnesses. Through the regular hosting of group health education, detailed information on advanced directives can be provided to family members.

Author Contributions: Conceptualization, H.-S.H.; data curation, H.-Y.L.; methodology, H.-S.H.; resources, H.-Y.L.; supervision, H.-S.H.; writing—original draft, H.-Y.L.; writing—review and editing, H.-S.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: This study was reviewed and approved by the Institutional Review Board in National Taiwan University Hospital Hsin-Chu Branch, with IRB number of 109-032-E.

Informed Consent Statement: Informed consent was obtained from all the subjects involved in the study.

Data Availability Statement: All the relevant datasets in this study are described in the manuscript.

Conflicts of Interest: The authors declare no conflicts of interest.

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