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The effect of joint involvement of nurse and physician in hospice care on terminal cancer patients on do-not-resuscitate orders signed by surrogates

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Abstract

Objectives. Patients with terminal cancer often experience physical and mental distress. Signing a do-not-resuscitate order (DNR) is crucial to protect against invalid treatment. This study aims to explore the effect of hospice shared care intervention by medical staff on the completion of a DNR-S (DNR order signed by surrogates) for patients with terminal cancer.

Method. The cross-sectional study in this research involved secondary analysis of data from the 2011–2015 clinical cancer case management database of a medical center in central Taiwan. Those with a DNR order signed by patients (DNR-P) or DNR-S before the hospice shared care consultation were excluded from this study; a total of 1,306 patients with terminal cancer were selected.

Results. This study demonstrated that the percentage of DNR-S after consultation involving both nurse and physician was 75.4%. With other variables controlled, the number of DNR-Ss after consultation with a nurse was significantly lower [odds ratio (OR) = 0.57, 95% confidence interval (CI) = 0.42–0.75] and that of DNR-Ss after consultation involving both nurse and physician was significantly higher (OR = 1.35, 95% CI = 1.01–1.79), than that of DNR-Ss after consultation with only the physician.

Significance of results. Joint involvement of the nurse and physician in hospice care provides sufficient information to patients and family with terminal cancer about their condition and enhances doctor–patient communication. This effectively assists patients with terminal cancer and their family members in making the major decision of signing a DNR, alleviates the concerns of patients and family members about signing a DNR, and reduces terminal cancer patients' pain at the end of life to ensure that they die in peace and dignity.

Introduction

Cancer has been the leading cause of death in Taiwan since 1982, and 50,232 people died of cancer in 2019 [Ministry of Health and Welfare Taiwan (MOHW), 2020]. After enduring diagnosis, treatment, recurrence, and various symptoms, patients with terminal cancer and their family members must eventually face death and decide whether patients should receive cardiopulmonary resuscitation (CPR) at the end of life; the entire process is extremely challenging. However, only 7.4% of patients with cancer survive after emergency treatment (Bruckel et al., 2017). To respect the dignity of patients at the end of life and reduce their distress, discussion between medical staff and patients and their families about whether to sign a do-not-resuscitate order (DNR) is important.

To implement patients' autonomy at the end of life and choice of good death, Taiwan passed the Hospice Palliative Care Act in 2000. The legislative purpose of the Act is to respect the willingness of patients with incurable, terminal cancer, and protect their rights. Patients and their families can choose to sign a DNR to request that CPR not be administered to the patients nearing the end of life/at the end of life or without vital signs of life. The DNR can also serve as a principle of medical care for medical staff providing hospice and palliative care (MOHW Taiwan, 2000; Lu, 2018). In Taiwan, approximately 60% coverage was achieved for patients receiving hospice care 1 year before their death (Health Promotion Administration Taiwan, 2020), which is considered relatively late. Some patients are not even referred to hospice care until they are close to death. Even though the completion of DNR has increased because the government and medical experts have heavily promoted hospice shared care,

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80% of DNRs are completed relatively late (Tsai et al., 2007). There are two types of DNRs in Taiwan, namely DNR-P (DNR order signed by patients) with autonomy and DNR-S (DNR order signed by surrogates) (Wen et al., 2013). The patient could not sign DNR-P due to their physical condition or unconscious. Therefore, DNR-S is important to improve patients' quality of life at the end of life.

The fear of death mirrors the concerns of traditional Chinese culture. Even when patients reach the end of life or are close to death, most families and medical staff still avoid discussing the topic of death with patients. Studies published in the literature have argued that the difficulties of medical personnel in informing patients of their medical conditions and unfamiliarity with relevant regulations adversely affect their discussions with patients and their families about DNR (Wu et al., 2009). Loke et al. (2011) discovered that the completion rate of DNR was 41.53% among patients with terminal cancer, but the percentage increased to 71.47% after the intervention of a hospice palliative care team. Nonetheless, patients with terminal cancer often consult with a hospice palliative care team 7–10 days before they reach the end of life (Huang et al., 2008, 2018). By the time the hospice palliative care team intervenes, patients have often become unconscious or have been in considerable pain; thus, the team loses the opportunity to directly communicate with patients to discuss their opinions and decisions regarding DNR at the end of life.

Cheng et al. studied 200 patients who had signed a DNR, among whom 23% had DNR-P and 54% had DNR-S because family members had signed after being informed of the incurable nature of the disease (Cheng et al., 2016). Huang et al. (2008) found that the terminal cancer patients' poor prognosis, lack of hospice care, and lack of awareness of their medical condition are correlated with DNR signing. A Japanese study indicated that over 90% of DNR were signed after discussion by physicians and family members, and there was no significant effect on DNR signed whether the patient itself join in the discussion of DNR (Abe et al., 2021). A study on advanced cancer patients' and caregivers' awareness of the medical condition and DNR revealed that patients' and their families' clear understanding of the medical condition and prognosis significantly affected the completion of DNR, with 70.7% of the patients finally signing a DNR (Shen et al., 2018).

In hospice palliative care consultation, hospice shared care may serve as a bridge connecting communications between the hospice palliative care team and the patient's original medical team about the patient's condition and care. A clear explanation of the condition by physicians would help the patients' and family members' cognition and symptom control of the condition. The nurses would acquaint patients or family members with the importance of DNR signed and decrease the psychological stress on DNR-S by providing comfort nursing care and support for caregivers in grief (including company and comfort). Most of the previous studies had focused on the effect of physicians on DNR, instead of consultation involving both nurse and physician. A consultation involving both nurse and physician enhances patients' recognition of their condition and symptom control, thereby increasing the DNR signing rate among patients with terminal cancer and improving their quality of life at the end of life (Cheng et al., 2016; El-Jawahri et al., 2017; Yennurajalingam et al., 2018).

Existing studies on patients with terminal cancer receiving hospice palliative care and increasing the completion rate of DNR have mostly focused on the effect of hospice palliative care consultation on patients' and family members' awareness of the medical condition and the purpose of signing a DNR as well as the influence of hospice care interventions on patient survival (Lu et al., 2016; Shih et al., 2018). There were generally about 7–10 days left until death when the hospice palliative care team intervenes. Most of the previous studies had focused on the effect of physicians on DNR, instead of consultation involving both nurse and physician (Huang et al., 2008, 2018). Few studies have discussed the correlation between medical intervention type and completion of a DNR-S for patients. Therefore, this study aimed to compare how different hospice palliative care interventions (consultation with a physician, a nurse, or both nurse and physician) affect the completion of DNR-S for patients with terminal cancer.

Methods

Data source and participants

This cross-sectional study involved secondary analysis of data from the 2011–2015 "clinical cancer case management database" of a medical center in central Taiwan. The data of the participants, including demographic characteristics, the type of cancer diagnosed, hospice palliative care intervention. The status of hospice palliative care intervention in Taiwan is that patients will be consulted by the hospice palliative physician if the primary treating physician makes the consultation sheet; patients will be consulted by the hospice palliative nurse if the primary treating nurse makes the consultation sheet; patients will be consulted by the hospice palliative physician and nurse as well if the primary treating physician and nurse all make the consultation sheet. In this study, patients were classified by the types of hospice palliative care intervention. Patients were classified to the "consultation with a physician" group if patients were only consulted by the hospice palliative physician; patients were classified to the "consultation with a nurse" group if patients were only consulted by the hospice palliative nurse; patients were classified to the "consultation involving both nurse and physician" group if patients were consulted by the hospice palliative physician and nurse as well. The "doctor" and "nurse" in this study means the palliative shared care team's physician and nurse, respectively. Also, both are first-time visiting the terminal patient, and the completion of a DNR-S. The study population were patients aged above 20 years old and with terminal cancer and had received hospice shared care during hospitalization. This study protocol was approved by the Institutional Review Board (CG16056B).

Statistical analysis

Chi-squared test was conducted to analyze the correlations between the demographic characteristics of patients and the completion of a DNR-S. Subsequently, multiple logistic regression was performed to explore the effect of joint involvement of nurse and physician in hospice care on DNR-S completion. IBM SPSS Statistics for Windows version 22.0 (IBM Corp., Armonk, NY, USA) was used to conduct statistical analysis. All statistical significance in this study was defined as $p < 0.05$.

Results

Among data of 4,281 patients with terminal cancer who aged above 20 years old and had received hospice shared care during hospitalization from the database, 2,355 patients who had signed DNR-P or DNR-S before receiving hospice shared care, and 620

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Table 1. Demographic data of patients with terminal cancer

Variable	*N*	%
Total	1,306	100.0
Sex		
Male	788	60.3
Female	518	39.7
Age (years)		
≤50	247	18.9
51–60	332	25.4
61–70	305	23.4
71–80	279	21.4
≥81	143	10.9
Hospice palliative care intervention		
Consultation with a physician	687	52.6
Consultation with a nurse	562	43.0
Consultation involving both nurse and physician	57	4.4
Cancer type		
Lung cancer	331	25.3
Colorectal cancer	141	10.8
Gastrointestinal cancer	342	26.2
Breast cancer	44	3.4
Head and neck cancer	128	9.8
Gynecologic oncology	46	3.5
Genitourinary tract cancer	89	6.8
Two or more types of cancer	49	3.8
Others	136	10.4

patients with a DNR-P after the hospice shared care consultation were excluded. Consequently, the data of the remaining 1,306 patients with terminal cancer who (1) had received hospice shared care intervention but (2) failed to complete a DNR were selected. The demographic variables of patients with terminal cancer included sex, age, and cancer type (Table 1). There were 332 (25.4%) of patients aged 51–60 years old in the study; 788 (60.3%) of them were male and the remaining 518 patients (39.7%) were female.

Regarding the hospice palliative care intervention, the majority of the patients consulted with a physician ($N = 687$, 52.6%), followed by those who consulted with a nurse ($N = 562$, 43.0%) and those who had consulted with both a nurse and a physician ($N = 57$, 4.4%). Among patients' cancer types, gastrointestinal cancer ($N = 342$, 26.2%) ranked the highest, followed by lung cancer ($N = 331$, 25.3%); the least common type was breast cancer ($N = 44$, 3.4%).

Results regarding bivariate analysis of patients' demographic data and the completion of a DNR-S (Table 2) are detailed as follows: Sex, as a demographic data variable, significantly correlated with the completion of a DNR-S ($p = 0.032$), with the number of DNR-S (67.2%) of female patients being higher than that of DNR-S (61.2%) of male patients. This study discovered that hospice palliative care intervention (consultation with a physician or nurse or both) significantly correlated with the completion of a DNR-S ($p = 0.013$). The *post-hoc* test result regarding hospice palliative care intervention indicated that compared with patients who consulted a nurse (59.6%), those who consulted a physician (65.8%) and those who consulted both a nurse and a physician (75.4%) had significantly higher rates of DNR-S completion.

Logistic regression analysis was conducted to predict the influence of the completion of a DNR-S when both the nurse and physician were involved in hospice care, and the results are shown in Table 3. Regarding the effect of different hospice palliative care interventions (i.e., hospice shared care consultation involving different medical professionals) on the completion of a DNR-S for patients with terminal cancer, compared with the number of completed DNR-S after receiving consultation with a physician (reference group), the number of completed DNR-S after receiving consultation with a nurse was 0.57 times [statistical significance, indicated by 95% confidence interval (CI) = 0.42–0.75] and the number of completed DNR-S after receiving consultation involving both nurse and physician was 1.35 times higher (statistical significance, indicated by 95% CI = 1.01–1.79).

Discussion

In developed countries, where patient autonomy is respected, DNR at the end stage of cancer is completed by the patient. DNR signed is one of the options for a good death in patients with terminal cancer which is a consensus after share discussion making between physician and patient. The study explored the effect of consultation involving both nurse and physician on the completion of a DNR. Nonetheless, whether the DNR signed has to respect and act in concert with the patients' opinions. In Asian and Chinese society, death is a taboo topic; family values and filial piety are respected. In such an environment, family participation in major life-or-death decisions (medical decisions) is to be expected. Even if patients have the capacity to make decisions on their own, family values, cultural values, and filial piety still interfere with patient autonomy, and thus, the grave decision is typically left to family members (Tsai et al., 2006). When patients are diagnosed with terminal illness, physicians often inform the patients' family members rather than the patients (Chen, 2007). Regarding the end-of-life care in the general wards, Phua et al. (2011) explored DNR discussions between physicians and patients and their family members, and discovered that 77.1% of DNR discussion involved family members. Under Taiwan's traditional patriarchal family culture, physicians often respect the opinions of family members in medical decisions. Family relations thus serve a unique and nonnegligible role in the interaction between physicians and patients; patients and family members influence each other with a common sense of obligation (Cong, 2004; Lin et al., 2009). Studies published in the literature have revealed that 90% of family members or surrogates wish to involve the physician in the DNR decision-making process, and 8% of family members hope to leave the decision completely to the physician, neglecting the autonomy of patients in decision-making (Hung, 2009). Due to the traditional paternalistic physician–patient relationship in the Eastern world and the trust of patients and family members in physicians, medical decisions are often made by physicians. Thus, patients and their families often comply with physicians' treatment decisions (Lin et al., 2009).

Death, a taboo in Chinese culture, complicates DNR discussions between medical staff, patients, and their family members. As a result, most patients have become unconscious or are near death when medical staff discuss hospice palliative care and

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Table 2. Correlation between the demographic data of patients and the completion of a DNR-S

Variable	Completion of a DNR-S		χ^2	*p*-value
	Not yet completed *N* (%)	Completed *N* (%)		
Total	476 (36.5)	830 (63.5)		
Hospice palliative care intervention			8.74	0.013
Consultation with a physician	235 (34.2)	452 (65.8)		
Consultation with a nurse	227 (40.4)	335 (59.6)		
Consultation involving both nurse and physician	14 (24.6)	43 (75.4)		
Sex			4.62	0.032
Male	306 (38.8)	482 (61.2)		
Female	170 (32.8)	348 (67.2)		
Age (years)			4.17	0.384
≤50	95 (38.5)	152 (61.5)		
51–60	133 (40.1)	199 (59.9)		
61–70	106 (34.8)	199 (65.2)		
71–80	95 (34.1)	184 (65.8)		
≥81	47 (32.9)	96 (67.1)		
Cancer type			13.36	0.100
Lung cancer	98 (29.6)	233 (70.4)		
Colorectal cancer	49 (34.8)	92 (65.2)		
Gastrointestinal cancer	136 (39.8)	206 (60.2)		
Breast cancer	18 (40.9)	26 (59.1)		
Head and neck cancer	53 (41.4)	75 (58.6)		
Gynecologic oncology	15 (32.6)	31 (67.4)		
Genitourinary tract cancer	40 (44.9)	49 (55.1)		
Two or more types of cancer	17 (34.7)	32 (65.3)		
Others	50 (36.8)	86 (63.2)		

DNR with their family members. Huang et al. found that 41.1% of DNRs (including DNR-Ps and DNR-Ss) are completed on the day of the death of patients with terminal cancer (Huang et al., 2018). In their research on Danish medical staff's attitude toward discussing DNR with patients with cancer, Saltbæk et al. (2020) found that 63% of medical staff hope to wait until patients' disease progresses to the end stage to discuss DNR with them. At this point, patients have fallen unconscious, forcing their family members to make the end-of-life decision (i.e., completion of DNR-S) in their stead due to the patients' incapacity to exercise their autonomy (Yang et al., 2016).

The hospice palliative care consultation helps patients and their families understand the treatment planning process for their disease. Lu et al. noted that consultation with the hospice palliative care team improves patients' and family members' disease awareness and DNR signing rate (Lu et al., 2016). In this study, the percentages of DNR-Ss completion improve (from 65.8% to 75.4%) after consultation with a hospice palliative care physician and with both hospice palliative care physician and nurse. Sufficient communication between nursing staff and patients helps patients understand their prognosis and survival condition. Nursing plans and care interventions provided by nurses can improve the quality of care at the end of life (Shen et al., 2018). In the doctor–patient relationship in the patriarchal society of Chinese traditional culture, trust in physicians is very important. Nurses generally provide nursing care and less intervention to the explanation of the condition or medical decisions. Therefore, the effect of consultation with a nurse on the DNR signed is lower than physicians.

In their study on agreement with DNR among patients, physicians, and nurses, Saltbæk et al. (2020) discovered that among the 188 sampled patients, 60% of them signed DNRs before death. Other studies in Taiwan are detailed as follows: Lu et al. discovered that after receiving consultation with hospice palliative care physicians, disease awareness of patients with cancer and their family members increased from 61.2% to 84.7%, and their DNR completion rate also increased from 44.0% to 80.0% (Lu et al., 2016); Wen et al. found that among the completed DNRs, 22.6% and 77.2% were DNR-P and DNR-S, respectively (Wen et al., 2013). Huang reported that after patients with terminal cancer and their family members had received hospice shared consultation, the DNR completion rate was 75.3%, 57.2% of which were DNR-S (Huang, 2016). In this study, the DNR-S completion rate was 63.6% after patients with terminal cancer receiving hospice

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Table 3. Critical factors influencing DNR-S completion for patients with terminal cancer

Variable	OR	95% CI	*p*-value
Hospice palliative care intervention			
Consultation with a physician (reference group)			
Consultation with a nurse	0.57	0.42–0.75	<0.001
Consultation involving both nurse and physician	1.35	1.01–1.79	0.041
Sex			
Female (reference group)			
Male	0.83	0.64–1.08	0.172
Age (years)			
≤50 (reference group)			
51–60	0.94	0.67–1.33	0.738
61–70	1.19	0.83–1.70	0.353
71–80	1.16	0.80–1.68	0.443
≥81	1.33	0.84–2.11	0.224
Cancer type			
Lung cancer (reference group)			
Colorectal cancer	0.81	0.52–1.24	0.327
Gastrointestinal cancer	0.66	0.48–0.92	0.014
Breast cancer	0.68	0.35–1.35	0.273
Head and neck cancer	0.72	0.47–1.13	0.152
Gynecologic oncology	0.85	0.43–1.69	0.647
Genitourinary tract cancer	0.57	0.34–0.93	0.026
Two or more types of cancer	0.88	0.46–1.68	0.693
Others	0.82	0.54–1.27	0.381

shared care consulted with physicians and nurses, and a statistically significant difference was observed ($p = 0.013$).

In this study, the completion rate of DNR-S was 1.35 times higher for joint involvement of physicians and nursing staff in the consultation than for consultation with a physician. The study demonstrates the effect of consultation involving both nurse and physician on the completion of a DNR. A consultation involving both nurse and physician would increase the DNR signing rate. The physician would enhance patients' recognition of their condition. The nursing staff for hospice palliative care often establish positive interactions with patients with terminal cancer and their families. Nursing professionals listen to their families' worries and accompany them through stages of loss and grief. The physician would further clear explain the condition and the nurse would further provide comfortable nursing care and support for caregivers in grief as well if a consultation involving both nurse and physician. When patients near the end of life, nursing professionals can help patients and their family members prepare for a good death and fulfill the final wishes of the patients. Nursing staff for hospice shared care may serve as a bridge connecting communications between the patient's original medical team and patients or family members. In addition to providing family care, nursing staff may refer patients or their family members to other professionals (e.g., counseling psychologists, social workers, spiritual care practitioners, and art therapists), which may greatly enhance the trust of patients and their families in medical care and may alleviate their feelings of being abandoned. To sum up, family members are more willing to sign a DNR when the consultation involves a physician (who is trusted by the patient and family members) and nursing staff; these trusted professionals relieve patients' concerns and provide comforting care at the end stage of cancer.

Potential factors influencing the completion of DNR-S in Taiwan are as follows: (1) DNR-S is easier to obtain than DNR-P; (2) DNR-S does not require the signature of two witnesses and the patient; (3) Patients do not wish to be informed of their medical condition when they are still conscious, and would rather leave the end-of-life decision (i.e., completion of DNR-S) to their family members (Wen et al., 2013); (4) Taiwanese people's belief that a bad life is better than a good death (Cheng et al., 2015); (5) Fear that family members or physicians would discontinue their treatment (Shih et al., 2016); and (6) The majority of DNR-Ss being completed by family members when patients are in a severe stage of their disease, close to death, or unconscious (Yang et al., 2016).

Research revealed that only by adequately informing patients of their medical condition and conducting physician–patient communication can the patients and their families obtain enough information to make the important decision of whether CPR should be administered to patients at the end of life; this helps patients to accept natural death and prepare them for a good death (Tang et al., 2015). The same study also showed that 51.04% of the patients wish to make such an important decision with their family members and that older patients, as well as patients with terminal diseases, are more likely to sign a DNR (Tang et al., 2015).

The aforementioned literature concurred that the intervention of hospice shared care can enhance the completion rate of DNR-S. Nonetheless, medical staff should endeavor to respect patients' values of quality of life and life span, allowing them the opportunity to think in advance about or decide on their lifestyle and medical treatment at the end of life while they still have their decision-making capacity (Wen, 2011).

Besides, research indicated that advance directives do not correlate with the types and stages of cancer (Kelley et al., 2009), but this study discovered a significant correlation between cancer type and completion of DNR-S. The completion rate of DNR-S was found to be significantly higher for patients with lung cancer than for patients with gastrointestinal cancer or genitourinary tract cancer. This is likely due to the fact that lung cancer represents the most common cancer death in Taiwan, which is well known to Taiwanese people due to wide dissemination in the media. When family members discuss end-of-life treatment plans and referrals for hospice palliative care, they thus have a relatively increased acceptance toward the idea of signing a DNR for patients with lung cancer. Approximately 80% of patients with gastrointestinal cancer or genitourinary tract cancer are unconscious or at the end of life when receiving hospice palliative care, and the majority of them do not get to discuss with physicians about referral for hospice palliative care until reaching stage IV cancer (Wen, 2011).

The hospice palliative care interventions may also affect the DNR-P. In this study, we only focused on the DNR-S according to the following reasons: (1) The study purposed to investigate the hospice palliative care interventions affect the completion of

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DNR; (2) The influential factors of DNR-P and DNR-S are not the same. DNR will be signed by surrogates only if patients could not sign DNR themselves due to their physical condition or unconscious; and (3) DNR-S is more common than DNR-P in Taiwan due to Taiwan's traditional culture. Also, the study population of this study is DNR-S the most. Therefore, we did not analyze the effect of hospice palliative care interventions on the DNR-P in this study.

In terms of research limitation, this study conducted secondary data analysis, but the database lacked educational level, marital status, religion, nature of work, interaction, and decision-making process data for patients and their families. The database also lacked statistics on the visit frequency of palliative shared care personnel before DNR-S completion. This study investigated patients who still had not signed a DNR-P or -S at the end stage of cancer. These patients had high expectations of medical treatment and life and were more hesitant toward DNR signing, which might have affected the present research results. Subsequent studies are suggested to explore the effects of family members' characteristics, cultural values, views on life and death, and interaction with the patient regarding DNR signing.

Conclusion

Patients with terminal cancer often experience physical and mental distress. Because treatment is limited at the end of life, signing a DNR is crucial to protect against invalid treatment that might prolong the patient's death and the distress of family members. Because Asian culture and Taiwan's traditional society are family-centered, when patients are at the end of their lives, the family members play a critical role in DNR signing.

This study found that families receiving different medical intervention models differed in the DNR signing rate: patients who received consultation with a palliative care physician, a palliative care nurse, and both nurse and physician had 65.8, 59.6, and 75.4% rates of DNR-S completion. The number of completed DNR-Ss after receiving consultation with both nurse and physician was 1.35 times higher than that of completed DNR-Ss after receiving consultation with a physician. The care provided by and discussions with hospice care professionals improve a sense of security in patients and their families, which reduces the feelings of guilt and self-blame perceived by family members (surrogates) when signing a DNR. This prepares patients and their family members psychologically in advance to face the patients' imminent death.

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