

Key Success Factors Affecting Family Members' Intention to Withdraw from Life-sustaining Treatment for Long-term Ventilator-dependent patients: Nursing Professionals' Perspective

Hsiao-Fang Chen

*The Ph.D. Program in Business and Operations Management, College of Management,
Chang Jung Christian University,
No. 1, Changda Rd., Gueiren District, Tainan City, 711301, Taiwan*

Jin-Yuan Chern

*Dept. of Health Care Administration, Chang Jung Christian University
No. 1, Changda Rd., Gueiren District, Tainan City, 711301, Taiwan
E-mail: chern@mail.cjcu.edu.tw*

Abstract

This study aimed to explore, from the perspective of nursing professionals, the key success factors which would significantly affect VDPs family members' decision about withdrawal from LST. A structured questionnaire composed of three constructs was developed and the analytic hierarchy process was adopted to collect and analyze the responses. Overall, "subjective norms" considered relatively important; family consensus and quality assurance were the two key factors when family members confronted the decision of withdrawing the LST for their beloved person.

Keywords: ventilator-dependent patient (VDP), analytic hierarchy process (AHP), life-sustaining treatment (LST), shared decision making (SDM), nursing professionals

1. Introduction

Mechanical ventilation after tracheal intubation is an important medical treatment and life-sustaining treatment (LST) for critical patients. While medical treatment may help delay death, for many vegetative people who have been dependent on respirators for a long time and are unconscious, it would cause long-term torture for patients and their families as well. Studies have found that about 60% of ventilator-dependent patients have reduced cognition, ability to understand information, and reduced communication skills. In addition, patients' life activities are completely dependent on the assistance of others, whose pain and stress are no less than patients. The use of ventilators may not improve the end-of-life (EoL) quality of terminally ill patients, usually only prolonging low-quality life, and may cause survival or psychological distress to the patient's family [1]. Therefore, after the third revision of the "Regulations on Tranquility and Alleviation" was promulgated and implemented on January 9, 2013, for patients who remain in a coma after intubation and cannot breathe

on their own, if they are confirmed as terminally ill by two specialist physicians, they can be treated with withdrawal of LST with consent by a family member. However, in clinical practice, first-line medical personnel, especially nursing professionals, often found that there are divergent opinions among family members, and it is difficult to come up with an effective final decision. In fact, the evaluation and selection of life-sustaining medical treatment for patients with long-term ventilator dependence often involves multi-faceted considerations, which are multi-criteria decision-making problems involving multiple levels, and there are dependencies and complex relationships among the elements at each level. Therefore, to reach a best decision, how to objectively and effectively assign appropriate weights to each decision-making criterion, and find out the possible relative relationship between each criterion so as to assist decision-makers (medical staff and family members) in the evaluation and withdrawal of life-supporting medical methods is an important issue. The purpose of this study is to use the well-known analytic approach AHP to construct a

set of evaluation and decision-making models, from the perspective of nursing professionals, for family members of patients with long-term ventilator dependence on withdrawal of life-support medical decisions.

2. Literature Review

When a patient falls into a coma and is unconscious, he/she is incapacitated and unable to communicate with others. Usually the family members must make decisions on behalf of the patient. Under such a circumstance, no matter whether the patient's willingness has been delivered, the family members will fall into a decision-making dilemma. This could be due to the fact that the patient and his/her family had not discussed the important decision before reaching the end of life. Therefore, they had no choice but to rely on life sustaining treatment (LST). Nevertheless, while the LST may prolong the patient's life, the quality of life suffers seriously. Meanwhile, the family members might suffer as well. All these highlight the importance of advance medical decision-making [2].

2.1. Ventilation-dependent

Ventilator-dependent patients refer to those who have used the respirator continuously for more than 21 days (inclusive), and the interruption time of the use of the respirator does not meet the definition of successful weaning off the respirator [3]. A study by Steinz et al. (2022) found that 42.2% of prolonged mechanical ventilation (PMV) patients admitted to the chronic respiratory care unit were in vegetative state/ minimally conscious state (VS/MCS); 32.5% had severe cognitive impairment, and 11.0% had mild to moderate cognitive impairment. Mortality was associated with poorer awareness and cognitive status. These findings underscore the importance of discussing end-of-life decisions regarding resuscitation and/or intubation in these chronically intubated patients [4].

The American Thoracic Society (ATS) issued a statement on the withdrawal of life-sustaining medicine: Respecting the patient's autonomy is the ethical basis for withdrawing and not granting life-sustaining treatment. When a patient lacks decision-making capability, the designated healthcare agent can make the decision on behalf of the patient to withdraw life-sustaining treatment when it is ineffective.

2.2. Withdrawal from life-sustaining treatment

"Withdrawal of life-sustaining treatment" literally means passive inaction. When a terminally ill patient

cannot avoid death even with the use of life-sustaining treatment, withdrawal of LST might indicate a way of respect of life and sustaining of dignity for the patient [5]. Solomon et al. (2005) found that medical staff's acceptance of withdrawal of life-sustaining medicine was lower than that of non-administration of life-sustaining treatment. This could be attributed to their subjective perception that withdrawal of life-sustaining medicine implies a negative action and allowing patients to die naturally is otherwise [6].

2.3. Key factors of withdrawal from life-sustaining treatment

There are no clear standards for when life-sustaining treatment should be terminated or withdrawn for terminally ill patients. Many factors play a role individually and collectively, such as ethics, socioeconomic status, culture, legal regulation, and family concerns [7], which could be classified into three categories as follows.

2.3.1. Behavior and attitude

The key factors include: (1) families' perception towards withdrawal of life-sustaining medicine, especially "regulation knowledge" and "attitude regarding promotion of palliative care" [8, 11]; (2) expected outcome of disease, i.e. the patient's prognosis[4], with "poor prognosis" boosting the willingness to withdrawal [9]; (3) personal and social values, especially guilt related to filial piety, decision-making and responsibility[10]; (4) willingness to care, referring to family cohesion, which serves as a predictor of decision making; (5) preference for disease treatment (without other chronic comorbidities) [8, 11]; and (6) culture and religious belief by taking into account the patient's cultural background [11, 12].

2.3.2. Subjective norms

There are six key factors, including: (1) family consensus [10]; (2) medical personnel attitudes (values) towards the withdrawal of life-sustaining medicine [13]; (3) medical personnel's experience with palliative medical [10]; (4) family dynamics, referring to different opinions among family members and decision-making conflicts; (5) assurance of quality of life, with focus on relieving patients' pain, respecting the patient's autonomy, avoiding excessive ineffective or inhumane medical treatment, allowing patients to pursue the rights and interests of hospice [13]; and (6) holding cross-team family meetings and ethical consultation to come up with shared decision-making [14].

2.3.3. Perceived behavioral control

Included are six key factors: (1) economic considerations associated with socioeconomic status, cultural belief, legal regulation and family concern [7]; (2) ethical and legal issues involving a complex balance between medical, legal, and ethical considerations; (3) knowledge related to end-of-life care to deal with symptom control after withdrawal/termination of life-support treatment [2]; (4) timing of communication [10]; (5) family members support with emotional comfort[2] and (6) grief counseling for dying family members.

3. Materials and Methods

This is a quantitative survey research study. Nursing professionals from a government-affiliated region-level teaching hospital in southern Taiwan were potential participants. First, based on an action-research design, a structured questionnaire composed of three constructs (18 sub-constructs) were developed through a literature review. Second, senior nursing professionals with abundant experience in caring VDPs were recruited for data collection. Third, the analytic hierarchy process (AHP) was adopted to collect and analyze the participants' responses.

3.1. Research tools

This study aimed to explore the key success factors of withdrawal of life-sustaining medical treatment for long-term ventilator-dependent patients, and provide a reference for clinical medical assistance to family members in medical sharing decision-making. At the first stage, a thorough review of literature was conducted and three main facets and 18 secondary facets were collected. At the second stage, a questionnaire was developed and distributed to the targeted nursing professionals. At the third stage, the Analytic Hierarchy Process (AHP) was adopted for data analysis.

AHP is a multi-criteria decision making (MCDM) approach by using both empirical data as well as subjective judgements of the decision-maker [15]. It decomposes a complex problem into several different meaningful constructs (criteria) and further into measurable sub-constructs (indicators), if necessary.

The computational procedures are described as follows.

Step 1. Pairwise compare the constructs and sub-constructs for their importance in the decision;

Step 2. Compute eigenvalues and eigenvectors;

Step 3. Compute inconsistency ratio.

Through the process, an overall priority value (weight) will be derived for each sub-constructs (alternatives). It is suggested that inconsistency ratios should be less than

0.1 or so to be considered reasonably consistent in completing serial pairwise comparisons.

In this study, the package software Expert Choice 11 (Expert Choice, Inc.) was adopted for further data analysis.

3.2. Research process

Figure 1 illustrates the research process for this study. After data were collected and built into the analytic model, inconsistency ratios were checked first to ensure the acceptable consistency. In this study, all ratios were less than 0.1, indicating reasonable pairwise judgement of priority between each pair of indicators for the solicited 10 questionnaires.

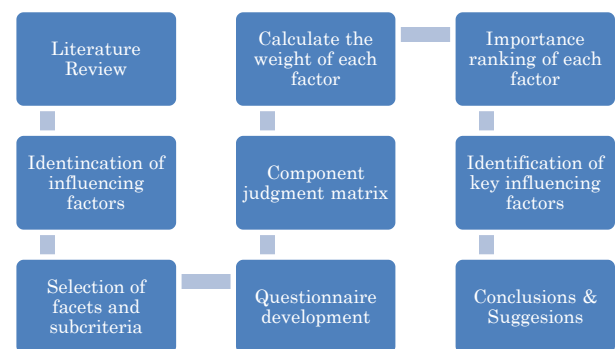


Figure 1. Illustration of research process.

The process of this study can be detailed as follows.

Phase1. Through a literature review, 18 sub-criteria applicable to the withdrawal of life-sustaining treatment for long-term ventilator-dependent patients were collected, which can be grouped into three main constructs (facets).

Phase 2. Design the questionnaire based on the facets and sub-criteria (factors) and distributed to the targeted nursing professionals.

Phase 3. Use the Expert Choice 11 to calculate the relative weight. Based on the results of relative weight, explain the meaning of each weight index.

Phase 4. Analyze relevant weights, and further discuss the application of research results in practice.

4. Research Results

Targeted on nursing professionals with abundant experience in caring VDPs, 10 copies of questionnaires composed of three constructs (18 sub-constructs) were collected and retained for this survey research study. The analytic results of relevant weight (priorities) for each sub-construct are demonstrated in Table 1.

Table 1. Relevant weights for each construct and sub-construct.

Constructs	Sub-constructs (factors)	Wc	Wi	Wci
Behavior & attitude		0.323		
	family perception		0.097	0.046
	exp. disease outcomes		0.264	0.068
	values		0.438	0.158
	willingness to care		0.081	0.015
	preference for treatment		0.076	0.021
	culture and region		0.045	0.015
Subjective norms		0.577		
	family consensus		0.373	0.199
	staff values		0.109	0.086
	staff caring experience		0.036	0.028
	family dynamics		0.177	0.139
	quality assurance		0.269	0.212
	family meeting		0.038	0.030
Perceived behavioral control		0.101		
	economic considerations		0.237	0.024
	ethical and legal issues		0.135	0.014
	EoL caring knowledge		0.218	0.022
	communication timing		0.082	0.008
	family emotion		0.295	0.030
	grief counseling		0.035	0.004

Wc: construct weight; Wi: sub-construct weight; Wci: overall weight (= Wc x Wi).

Overall, “subjective norms” (Wc=.577) was considered relatively important than “behavior/attitude” (Wc=.323) and “behavior control” (Wc=.101). Further, “family consensus” (Wi=.199) was considered as the first priority, followed by “quality assurance” (Wi=.196) and “individual value” (Wi=.159). On the contrary, “grief counseling” (Wi=.004), “communication timing” (Wi=.008) and “ethics and legal” (Wi=.014) were with the least priorities. Family consensus and quality assurance are the two key factors when family members confront the decision whether to withdraw the LST for their beloved person.

5. Conclusions

Families often face difficult decisions when caring for terminally ill beloved ones. Better communication between health care providers and family members, especially primary caregivers, to reduce negative perceptions towards palliative care can help reduce psychological confusion and distress. Through education, training and role-playing, medical personnel may realize the importance of the role in end-of-life care, and have less moral remorse when implementing it. Establishing a

standardized medical order for withdrawing life-sustaining treatment will also help medical personnel play a better role in shared decision making scenarios.

As is said, “No matter how advanced medicine is, it will never be able to cure all diseases.” The traditional first aid process for terminally ill patients not only fails to achieve the purpose of prolonging life, but instead aggravates the pain of terminally ill patients and prolongs the process of dying. For those who have to face complete disability and must continue to rely on life-support medical care for the rest of their lives, quality of life sometimes becomes an even more urgent issue.

In summary, “subjective norm” is perceived as a relatively important criterion in making decisions regarding withdrawal of life-sustaining treatment. Among the sub-constructs, “family consensus” and “quality assurance” outweigh the other factors. It is thus suggested that encouraging family members to reach consensus for their beloved ones’ end-of-life decisions becomes a top priority.

References

1. Meeker, M. A., & Jezewski, M. A. (2009). Metasynthesis: withdrawing life-sustaining treatments: the experience of family decision-makers. *Journal of Clinical Nursing*, 18(2), 163-173. [10.1111/j.1365-2702.2008.02465.x](https://doi.org/10.1111/j.1365-2702.2008.02465.x)
2. Pei-Ni Chuang., Jaw-Shiun Tsa., Hsien-Liang Huang. (2018). Ethical Dilemmas in Withdrawing Life Sustaining Treatments in Geriatric Patients. *Geriatrics gerontology*, 13(1), 28-44.
3. Health insurance consultation (2022). https://www.nhi.gov.tw/Content_List.aspx?n=A27FC07E1D6ACC13&topn=5FE8C9FEAE863B46
4. Stein, D., Sviri, S., Beil, M., Stav, I., & Marcus, E. (2022). Prognosis of Chronically Ventilated Patients in a Long-Term Ventilation Facility: Association with Age, Consciousness and Cognitive State. *Journal of Intensive Care Medicine*, , 08850666221088800.
5. Savelkoul, C., de Graeff, N., Kompanje, E. J., & Tjan, D. H. (2016). Treatment in the Intensive Care Unit: continue o withdraw? *Nederlands Tijdschrift Voor Geneeskunde*, 160, A9694.
6. Solomon, M. Z., Sellers, D. E., Heller, K. S., Dokken, D. L., Levetown, M., Rushton, C., Truog, R. D., & Fleischman, A. R. (2005). New and lingering controversies in pediatric end-of-life care. *Pediatrics*, 116(4), 872-883.
7. Morgan, J. (2015). How do you decide when to withdraw life support? *The Lancet Respiratory*

- Medicine, 3(6), 430-431.
8. Lobo, S. M., De Simoni, F. H., Jakob, S. M., Estella, A., Vadi, S., Bluethgen, A., Martin-Loeches, I., Sakr, Y., & Vincent, J. (2017). Decision-making on withholding or withdrawing life support in the ICU: a worldwide perspective. *Chest*, 152(2), 321-329.
9. Hoel, H., Skjaker, S. A., Haagensen, R., & Stavem, K. (2014). Decisions to withhold or withdraw life-sustaining treatment in a Norwegian intensive care unit. *Acta Anaesthesiologica Scandinavica*, 58(3), 329-336.
10. Chen, Y., Loh, E., & Huang, T. (2020). Humanity behind the intention of primary caregiver to choose withdrawing life-sustaining treatment for terminating patients. *Patient Education and Counseling*, 103(12), 2477-2482. 10.1016/j.pec.2020.06.011
11. Huynh, T. N., Walling, A. M., Le, T. X., Kleerup, E. C., Liu, H., & Wenger, N. S. (2013). Factors associated with palliative withdrawal of mechanical ventilation and time to death after withdrawal. *Journal of Palliative Medicine*, 16(11), 1368-1374.
12. Chai, H. Z., Krishna, L. K. R., & Wong, V. H. M. (2014). Feeding: what it means to patients and caregivers and how these views influence Singaporean Chinese caregivers' decisions to continue feeding at the end of life. *American Journal of Hospice and Palliative Medicine*, 31(2), 166-171.
13. Brown-Saltzman, K., Upadhy, D., Lerner, L., & Wenger, N. S. (2010). An intervention to improve respiratory therapists' comfort with end-of-life care. *Respiratory Care*, 55(7), 858-865.
14. Kon, A. A., Davidson, J. E., Morrison, W., Danis, M., & White, D. B. (2016). Shared decision making in intensive care units: an American College of Critical Care Medicine and American Thoracic Society policy statement. *Critical Care Medicine*, 44(1), 188.
15. Saaty, T. L. (1980). *The Analytic Hierarchy Process*. McGraw Hill, New York.

Jin-Yuan Chern, Ph.D.



He received his Ph.D. degree from the Medical College of Virginia/Virginia Commonwealth University, Virginia, US. Currently, he is an assistant professor at the Department of Health Care Administration, Chang Jung Christian University. His research interests include organization theory and management, and data applications and decision making.

Authors Introduction

Hsiao-Fang Chen, MHA, RN



She received her MHA from the Department of Health Care Administration, Chang Jung Christian University (CJCU), Tainan, Taiwan. Currently, she works full time as a Nursing Supervisor with specialization in respiratory therapy, medical administration, and health consultation and management at a government-affiliated hospital in southern Taiwan. She is also a doctoral program student in the College of Management, CJCU.