



Knowledge, Attitudes and Nursing Stress Related to Life-Sustaining Treatment among Oncology Nurses

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Purpose: This study investigated knowledge, attitudes, and nursing stress related to life-sustaining treatment among oncology nurses. **Methods:** A descriptive study design was used. Data were collected through a survey from April 1 to May 31, 2022. The participants were 132 nurses working in the oncology ward of a tertiary hospital in Seoul. Data were analyzed using the SPSS 25.0 program with descriptive statistics, the independent t-test, analysis of variance, and Pearson correlation coefficients. **Results:** The average scores for knowledge, attitudes, and nursing stress related to life-sustaining treatment were 14.42, 3.29, and 3.96, respectively. Significant differences in knowledge about life-sustaining treatment were observed based on clinical experience ($P=0.029$) and education about life-sustaining treatment ($P=0.044$). Attitudes toward life-sustaining treatment varied significantly with education about life-sustaining treatment ($P=0.014$), while stress levels differed significantly across working units ($P=0.004$). A positive correlation was found between the dilemma of extending or stopping life-sustaining treatment (a subdomain of nursing stress) and attitudes toward life-sustaining treatment ($r=0.260$, $P=0.003$). **Conclusion:** There was no significant correlation between the nursing stress experienced by oncology nurses and their knowledge and attitudes toward life-sustaining treatment. However, a more positive experience with life-sustaining treatment education was associated with higher stress levels related to the dilemma of extending or stopping life-sustaining treatment. Therefore, it is crucial to develop strategies to manage this dilemma and reduce stress in the field.

Key Words: Life support care, Oncology nursing, Knowledge, Attitude, Psychological stress

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INTRODUCTION

1. Background

The development of modern medicine has enabled the recovery of patients suffering from previously incurable diseases and significantly reduced the mortality rate among critically ill patients. However, the use of life-sustaining treatment (LST) for terminally ill patients has sparked debate due to its potential

to prolong physical and psychological suffering [1]. LST refers to care activities that extend the dying process rather than treating the patient's condition. These procedures include cardiopulmonary resuscitation, hemodialysis, the administration of anticancer drugs, and the use of a ventilator for patients nearing the end of life [2], and conflicts and ethical problems have emerged between guardians and medical staff or between medical staff regarding the continuation of such treatment [3]. In response to social discussions about LST, the Act on

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Hospice and Palliative Care and Decisions on Life-Sustaining Treatment for Patients at the End of Life (hereinafter referred to as the Act on Decisions on Life-Sustaining Treatment) was enacted to ensure respect for the self-determination of patients and has been in force since February, 2018 [2].

Malignant neoplasms (cancer) have been the leading cause of death in Korea since 1983, and 74.8% of all deaths in Korea in 2021 were reported to have occurred in medical institutions [4]. In a previous study [5], the most common place of death for cancer patients was the hospital ward (69.4%), indicating that oncology nurses are likely to encounter a significant number of terminal patients. Furthermore, patients nearing the end of their lives often prefer to pursue palliative care for a dignified death, rather than undergoing aggressive treatment [6]. In fact, according to the Ministry of Health and Welfare [7], the number of registered implementation documents of decisions on withholding or withdrawing LST has more than doubled from 80,000 in 2019 to 160,000 in 2021, and most terminal patients make decisions on LST by their families right before death [5].

Medical staff responsible for the care of terminal patients are tasked with providing both the patients and their families with accurate information to guide their decisions regarding LST. However, due to misconceptions about the system, the complexity of the procedure, challenges in its practical application, and inadequate training, it can be difficult for medical staff to effectively implement this act in a clinical setting [8,9]. This is particularly true for nurses, who are in constant contact with patients. If they lack sufficient knowledge about LST decisions, they are unable to provide patients and their guardians with accurate and objective information. This, in turn, makes it challenging for them to deliver patient care that aligns with decisions made about LST [10].

Most patients and guardians have expressed a preference for experienced nurses who can provide comprehensive explanations when making end-of-life decisions [11]. This underscores the significant role nurses play in the process of deciding to withdraw LST. Notably, patients and their families often consult nurses about their decisions before deciding to withdraw LST [12], and nurses' attitudes toward LST may have significant effects on their decisions [13]. Since oncology nurses frequently interact with patients and guardians contemplating whether to withhold or withdraw LST, their role is even more

critical. Furthermore, since nurses' attitudes toward LST can impact their understanding and execution of their role [14,15], appropriate attitudes toward the LST system need to be established in addition to ensuring that nurses have adequate knowledge of the system.

Although patients' self-determination regarding their decisions to withdraw LST is safeguarded by law, medical staff in the clinical field are exposed to stressful situations involving a variety of dilemmas when they implement the LST decision system [16]. Nurses, in particular, experience stress when caring for terminally ill patients due to challenges in communication with family members and other medical staff, administrative tasks related to the Act on Decisions on Life-Sustaining Treatment, and ambiguity surrounding their roles as defined by the Act [17]. Cancer treatment, which often involves surgery, chemotherapy, and radiotherapy, is a lengthy process that demands high-level care for both patients and their guardians [18]. Therefore, nurses are tasked with caring for their assigned inpatients, patients contemplating the withdrawal of LST, and their respective family members [19]. Moreover, nurses often endure emotional strain. For example, witnessing the deterioration of a patient's condition can induce feelings of guilt, and observing patients at the end of life can evoke feelings of sorrow [16,20]. Therefore, nurses are likely to experience heightened stress in clinical situations involving LST, leading to decreased job satisfaction and increased frustration, which can hinder their ability to provide high-quality care [12].

In the majority of studies conducted after the implementation of the Act on Decisions on Life-Sustaining Treatment, the primary focus was on the attitudes, roles, and stress levels of nursing students, intensive care unit (ICU) nurses, and nurses working in various wards in relation to LST [12,14-16,19,20]. There has been limited research exploring the knowledge, attitudes, and stress levels of oncology nurses regarding LST, despite these nurses often finding themselves in situations where they must make decisions related to LST. When it comes to knowledge, most studies have focused on nurses' understanding of advance directives [9,11,21,22], while few have explored the overall level of knowledge among nurses caring for terminal patients about the specifics of LST, related legislation, and its correlation with job stress. Among cancer patients undergoing active treatments such as surgery and chemotherapy in

oncology wards, many face decisions about whether to discontinue LST, and nurses are tasked with providing concurrent end-of-life care. Unlike in the ICU, where family members are not permitted to enter and LST-related equipment can be used, most family members stay in oncology wards and are frequently exposed to conflicts. Therefore, the knowledge, attitudes, and stress of oncology nurses regarding LST need to be investigated.

This study aimed to investigate oncology nurses' knowledge, attitudes, and job stress related to LST, identify their relationships with each other, and provide foundational data for the development of educational programs for LST that can be applied to nurses in the clinical field.

METHODS

1. Purpose

The purpose of this study was to identify correlations among the knowledge, attitudes, and job stress of oncology nurses at Catholic University Hospital regarding LST, and the detailed goals were as follows.

- 1) To identify the levels of oncology nurses' knowledge, attitudes, and nursing stress related to LST
- 2) To identify differences in oncology nurses' knowledge, attitudes, and nursing stress related to LST according to their general characteristics
- 3) To identify correlations among oncology nurses' knowledge, attitudes, and nursing stress related to LST

2. Study design

This descriptive study was conducted to explore oncology nurses' knowledge, attitudes, and nursing stress related to LST and identify the correlations among these variables.

3. Participants

The participants of this study were nurses employed in the oncology ward of C University S Hospital in Seoul, who understood the study's purpose and agreed to participate. Given the study's focus on clinical experience with LST, nurses with less than a year of clinical experience were not included.

The G*Power program was used to determine the necessary

sample size for our study. After calculations, using a significance level of 0.05, a medium effect size of 0.30, and a power of 0.90 in an analysis employing Pearson's correlation coefficients, we found that we required a sample size of 112. To account for a potential dropout rate of 20%, we distributed a total of 138 questionnaires. We collected all 138 questionnaires, but only 132 were used in the study, as we excluded 6 participants who did not fully complete the questions.

4. Study tools

1) General characteristics

The general characteristics of the participants were investigated, including gender, age, marital status, education level, and religion. We also examined their clinical experience, working unit, experience with LST education, and their experience caring for patients on LST, as well as their experiences with the death of patients under their care and the death of family members or acquaintances.

2) Knowledge of life-sustaining treatment

Knowledge of LST was measured using the Knowledge Scale of Life-Sustaining Treatment Decision System (KS-LSTD), which was developed by Park et al. [23]. This scale consists of 23 items, which are answered "correct," "wrong," and "unknown." Correct answers are given 1 point, and wrong or "unknown" answers are given 0 points. The total score can range from 0 to 23 points, with a higher score indicating a greater understanding of LST. When the scale was initially developed, its reliability was shown by a KR-20 value of 0.62, and in this study, the KR-20 value was 0.75.

3) Attitudes toward life-sustaining treatment

Attitudes toward LST were measured using the scale developed by Byun et al. [24] and revised and supplemented by Lee and Kim [15], after obtaining the developer's consent. This scale consists of 17 questions, uses a 5-point Likert scale, and contains 3 positive items and 14 negative items about LST. A higher mean score means positive attitudes toward withdrawing LST. Cronbach's α was 0.78 in Lee and Kim's study [15] and 0.74 in this study.

4) Nursing stress about life-sustaining treatment

The level of stress related to LST nursing was assessed using Lee’s scale [15] with the developer’s prior consent. This scale is composed of 28 items: 6 items concerning the burden of LST, 8 items regarding experiences of mental exhaustion, 6 items about conflicts with an LST patient’s family, 2 items on the burden of operating LST equipment, 3 items on compassion for LST patients, and 3 items on dilemmas related to extending or ceasing LST. These items were evaluated using a 5-point Likert scale, with a higher average score indicating a greater degree of nursing stress related to LST. In Lee and Kim’s study [15], Cronbach’s α was .93 and .88 in this study. The confidence interval for the subdomains was 0.64~0.85.

5. Ethical considerations

The content and methods of this study were approved by the institutional review board of C University S Hospital located in Seoul (KC22QISI0124). The written explanation of the study included the purpose, procedures, data collection process, decisions of consent to participate and to withdraw participation, and confidentiality, and data were collected after the participants were explained that the content of the questionnaire would only be used for research purposes and written consent was obtained from those who agreed to participate in the study.

6. Data collection

Data were collected from April 1, 2022 to May 31, 2022. The researchers held meetings with the heads of the nursing department and the oncology ward at the hospital. During these meetings, they outlined the study’s objectives and requested assistance with data collection. Subsequently, the researchers explained the study’s objectives and the questionnaire’s content to nurses who had experience caring for cancer patients. They then asked those who voluntarily agreed to participate in the study to fill out the questionnaire. As a token of appreciation, participants in the study were given a small reward.

7. Data analysis

The collected data were analyzed using the SPSS/WIN 25.0 program. The participants’ general characteristics, knowledge, attitudes, and nursing stress related to LST were analyzed us-

ing frequency, percentages, mean, and standard deviation. Differences in participants’ knowledge, attitudes, and nursing stress related to LST according to their general characteristics were analyzed with the independent t-test and one-way analysis of variance (ANOVA), and the Scheffé test was used for the post-hoc test. The correlations among participants’

Table 1. General Characteristics of Oncology Nurses (N=132).

Characteristics	n (%)	M±SD
Gender		
Male	3 (2.3)	
Female	129 (97.7)	
Age (yr)		
≤25	39 (29.5)	
26~29	50 (37.9)	
≥30	43 (32.6)	28.6±4.2
Marital status		
Single	98 (74.2)	
Married	34 (25.8)	
Education		
Diploma	7 (5.3)	
Bachelor	101 (76.5)	
≥Master’s	24 (18.2)	
Religion		
Yes	59 (44.7)	
No	73 (55.3)	
Clinical experience (yr)		
≤2	25 (18.9)	
3~5	49 (37.1)	
6~10	42 (31.8)	
≥11	16 (12.1)	5.7±4.2
Working unit		
Medical ward	108 (81.8)	
Surgical ward	19 (14.4)	
Other	5 (3.8)	
Education of life-sustaining treatment		
Yes	84 (63.6)	
No	48 (36.4)	
Experience of life-sustaining nursing care		
Yes	119 (90.2)	
No	13 (9.8)	
Experience of a patient’s death		
Yes	113 (85.6)	
No	19 (14.4)	
Experience of a family member’s or acquaintance’s death		
Yes	108 (81.8)	
No	24 (18.2)	

knowledge, attitudes, and nursing stress related to LST were analyzed using Pearson correlation coefficients.

RESULTS

1. General characteristics of participants

Among the total 132 participants in this study, 129 (97.7%) were women, and the mean age was 28.6 ± 4.2 years. Ninety-eight (74.2%) participants were single and 101 (76.5%) had

Table 2. Levels of Knowledge, and Attitudes on Life-Sustaining Treatment among Oncology Nurses (N=132).

Variables (items)	Rank	Questions	Correct (%) or Mean \pm SD
Knowledge (23)	1	End-stage patients refer to patients diagnosed by medical staff with no possibility of fundamental recovery within months and worsening [symptoms] despite active treatment.	124 (93.9)
	2	Patients cannot change or withdraw after preparing a LST plan.	122 (92.4)
	3	The dying process refers to a condition in which there is no possibility of rehabilitation, does not recover despite treatment, and is about to die due to rapid deterioration of symptoms.	118 (89.4)
	3	A LST plan refers to a document prepared by planning matters related to the decision, such as suspension of LST, and hospice according to the will of a terminal patient or a patient in the dying process.	118 (89.4)
	5	Medical procedures that can be discontinued in patients who have decided to suspend or discontinue LST include blood pressure enhancers and blood transfusions.	117 (88.6)
	6	LST includes cardiopulmonary resuscitation, hemodialysis, chemotherapy, and ventilator action, as well as medical procedures determined by the doctor in charge that it is necessary to suspend.	116 (87.9)
	7	The LST plan shall be prepared by the doctor in charge according to the will of the terminal patient or the patient on the way of death.	111 (84.1)
	8	If a patient in the dying process who cannot express his/her intention is a minor, LST may be discontinued by confirming the consent of the legal representative (limited to the right to advance).	104 (78.8)
	9	Patients who decide to stop LST may stop supplying oxygen through nasal cannula or oxygen masks.	97 (73.5)
	10	LST plans can only be prepared for inpatients.	97 (73.5)
	11	If it is determined that the doctor in charge and one specialist in the field are a patient in the dying process, LST may be reserved or discontinued if the patient's intention is confirmed with a letter of intent for LST.	93 (70.5)
	12	Even if the patient is conscious, if the patient's family wishes, LST may be suspended or stopped after agreement with the doctor in charge without notifying the patient of the decision, such as medical condition and suspension of LST.	93 (70.5)
	13	If a patient who has been discharged from the hospital after preparing a LST plan returns to the hospital several months later, the effect of the existing LST plan is not maintained and must be rewritten.	91 (68.9)
	14	LST plans can be prepared only with family opinions instead of patients.	73 (55.3)
	15	The doctor in charge of preparing the LST plan and the doctor in charge of preparing the "patient judgment in the dying process" should be the same.	68 (51.5)
	16	If there is one family member of a patient on an unconscious deathbed process, if one family member states that he or she will not receive LST, he or she may suspend or suspend LST.	66 (50.0)
	17	It is impossible for foreigners to draw up a life-prolonging medical plan.	65 (49.2)
	18	The Life-sustaining Treatment Decision Act is the legalization of euthanasia and dignity.	54 (40.9)
	19	The elderly, who do not have any family members or live alone, do not usually express their opinions, and if they cannot express their opinions, they cannot decide whether to postpone or stop life-prolonging medical treatment.	50 (37.9)
	20	After the doctor in charge was diagnosed as a terminal patient, a LST plan was prepared with the patient. The advance letter of intent for LST previously prepared by the patient becomes invalid.	46 (34.8)
	21	Continuous vegetative and brain death patients are subject to reservation or suspension of LST.	28 (21.2)
	22	Currently, if a patient cannot express his or her opinion and cannot confirm the patient's opinion on LST, the immediate family members who decide LST are parents, children, and siblings.	20 (15.2)
	23	People with intellectual disabilities or mild dementia who can express their opinions can draw up a life-prolonging medical plan.	16 (12.1)
Total			14.42 \pm 2.79

a bachelor’s degree. Fifty-nine (44.7%) were religious. The mean clinical experience was 5.7 ± 4.2 years, and the majority of participants ($n=103$, 81.8%) worked in internal medicine wards. Eighty-four (63.6%) participants had experienced LST education and 119 (90.2%) had experienced life-sustaining nursing care. Furthermore, 113 (85.6%) participants had experienced a patient’s death, and 108 (81.8%) experienced the death of an acquaintance (Table 1).

2. Knowledge, attitudes, and nursing stress of participants related to life-sustaining treatment

1) Knowledge of life-sustaining treatment

The mean score for the participants’ knowledge of LST was 14.42 ± 2.79 out of 23. The item with the highest percentage (93.9%) of correct answers was “End-stage patients refer to patients diagnosed by medical staff with no possibility of fundamental recovery within months and worsening [symptoms] despite active treatment” correctly, while “People with intellectual disabilities or mild dementia who can express their opinions can draw up a life-prolonging medical plan” received the lowest percentage (12.1%) of correct answers (Table 2).

2) Attitudes toward life-sustaining treatment

The mean score for the participants’ attitudes toward LST was 3.29 ± 0.41 points. The item “A patient has a right to choose withdrawal of LST” had the highest mean score of 4.58 ± 0.64 points, and the item “Withdrawal of LST should be allowed for organ transplant” received the lowest mean score of 2.23 ± 0.90 (Table 2).

3) Nursing stress about life-sustaining treatment nursing

The mean score for the participants’ nursing stress about LST was 3.96 ± 0.41 . The item “When a doctor makes unclear order” had the highest score of 4.50 ± 0.60 points, and the item “When I have to decide to discontinue LST suddenly after decision made on LST” had the lowest score of 3.15 ± 1.04 (Table 3).

3. Differences in knowledge, attitudes, and nursing stress of participants related to life-sustaining treatment according to their general characteristics

The knowledge of LST among participants varied significantly based on their clinical experience ($F=3.09$, $P=0.029$) and their experience of LST education ($F=2.06$, $P=0.044$)

Table 2. Continued.

Variables (items)	Rank	Questions	Correct (%) or Mean \pm SD
Attitude (17)	1	A patient has a right to choose withdrawal of LST.	4.58 ± 0.64
	2	If a patient chooses WLST instead of pursuing painful treatment, it can be a way for the patient.	4.07 ± 0.68
	3	If a LST patient or family request WLST due to religious faith, it should be respected.	3.83 ± 0.79
	4	WLST can be one of the methods for older patients with incurable diseases to end their life.	3.73 ± 0.85
	5	It is advisable to get a consent on CPR prohibition when cardiac arrest is expected for the LST patient.	3.36 ± 0.86
	5	A LST patient should be discharged under family’s signature if the family want.	3.36 ± 0.93
	7	If a LST patient or family request, pressor-agents should be stopped even if blood pressure is low.	3.35 ± 0.96
	8	CPR for cardiac arrest should be performed for a patient on LST.	3.30 ± 1.34
	9	Even for a LST patient, life should be extended using every available treatment methods.	3.28 ± 0.49
	10	A patient’s family has a right to choose WLST on behalf of the patient.	3.08 ± 1.03
	11	If a LST patient and family request WLST due to financial difficulties, it should be allowed.	3.07 ± 0.94
	12	If a LST patient or family refuse airway intubation, it should be discontinued even if it is needed.	3.05 ± 1.04
	13	It is unacceptable for health professionals just to watch patient dying without providing any treatments.	2.99 ± 1.02
	14	WLST should be allowed for organ transplant.	2.96 ± 0.90
	15	Medical staff’s decision of WLST is available if a patient with incurable status have no supporting family.	2.94 ± 1.02
	16	Use of ventilator for unconscious patient on LST should be discontinued if the patient’s family want.	2.92 ± 0.97
	17	WLST should be allowed for organ transplant.	2.23 ± 0.90
	Total		3.29 ± 0.41

LST: Life sustaining treatment, WLST: Withdrawal of life sustaining treatment.

Table 3. Level of Nursing Stress Related to Life-Sustaining Treatment of Oncology Nurses (N=132).

Factor	Questions	Mean ± SD
Burden of LST care	When I see myself become insensitive as I take care of a patient on LST	3.62 ± 0.95
	When I feel doubt about my job after caring of a patient on LST	3.44 ± 1.06
	When I feel demotivated after caring of a patient on LST	3.42 ± 1.10
	When I feel I have to care of a patient on LST again	3.62 ± 1.05
	When I have to care of patients on LST often	4.00 ± 0.92
	When I cannot inform a LST patient's family on hopeless recovery	4.02 ± 0.88
	Subtotal	3.73 ± 0.41
Experience of mental exhaustion	When there are not many things I can do for a LST patients	3.75 ± 0.81
	When a patient's condition gets worse despite of LST	4.05 ± 0.85
	When a patient cannot receive LST due to his/her economic reason	3.61 ± 0.86
	When I feel empathy with a LST patient	3.73 ± 0.93
	When a patient who has been on LST for a long time finally dies	4.02 ± 0.87
	When a patient dies even after aggressive LST (e.g. CRRT, CPR)	3.85 ± 0.94
	When I see myself thinking about stopping LST for a patient without recovery	3.73 ± 0.94
	When difficult to care of a LST patient systematically	3.86 ± 0.70
Subtotal	3.83 ± 0.53	
Conflict with a LST patient's family	When a family's demands increase after LST decision made	3.95 ± 0.88
	When a family blame medical team	4.21 ± 0.81
	When a family get angry or deny their loved one's situation	4.25 ± 0.80
	When a LST patient causes too much workload on me	4.33 ± 0.65
	When there is conflict between family's demand and doctor's decision	4.21 ± 0.77
	When a LST patient's treatment plan and direction is unclear	4.14 ± 0.75
Subtotal	4.20 ± 0.46	
Burden of operating LST equipment	When my skill and knowledge for caring a LST patient is insufficient	4.00 ± 0.83
	When I am not able to respond to emergency quickly	4.14 ± 0.78
	Subtotal	4.07 ± 0.71
Compassion for LST patients	When a family is focusing on non-priority when a LST patient is in emergency	4.34 ± 0.71
	When a doctor orders continuation of LST without properly explaining about a patient's condition to his/her family	4.31 ± 0.58
	When a doctor makes unclear order	4.50 ± 0.60
	Subtotal	4.38 ± 0.47
Dilemma related to LST extension or cessation	When I have to decide to discontinue LST suddenly after decision made on LST	3.15 ± 1.04
	When LST patient care is continued despite a heavy workload	4.34 ± 0.76
	When what a family wants for LST patient's treatment plan is unclear	4.22 ± 0.69
	Subtotal	3.88 ± 0.55
Total		3.96 ± 0.41

LST: Life sustaining treatment.

(Table 4). Specifically, nurses with 11 or more years of clinical experience demonstrated the greatest understanding of LST. This was followed by those with 6~10 years of experience, and then by those with 5 or fewer years of experience. Thus, a longer duration of clinical experience was associated with a higher level of LST knowledge. Furthermore, participants who had received education on LST exhibited a higher level of understanding compared to those who had not.

Nurses who had received education on LST also demonstrated more positive attitudes toward LST, as evidenced by

their higher scores than those who did not receive such education ($F=2.50$, $P=0.014$).

Significant differences in LST nursing stress were observed across various work units. Nurses in the internal medicine ward and other wards (pediatric wards and integrated wards of internal medicine and surgery) exhibited high scores. Conversely, nurses in surgery wards demonstrated lower scores ($F=5.80$, $P=0.004$).

Table 4. Differences in Knowledge, Attitudes, and Nursing Stress Related to Life-Sustaining Treatment by Nurses' General Characteristics (N=132).

Characteristics	Knowledge		Attitude		Nursing stress	
	M±SD	t or F (P)	M±SD	t or F (P)	M±SD	t or F (P)
Gender						
Male	11.67±1.15	1.74 (0.084)	3.49±0.62	0.81(0.419)	3.86±0.73	0.43 (0.668)
Female	14.48±.2.78		3.30±.0.41		3.96±0.41	
Age (yr)						
≤25	14.38±2.62	1.55 (0.215)	3.31±0.37	0.31 (0.735)	3.95±0.36	0.08 (0.923)
26~29	13.96±3.15		3.32±0.42		3.95±0.36	
≥30	14.98±2.42		3.26±0.44		3.98±0.51	
Marital status						
Single	14.34±2.77	0.31 (0.578)	3.30±0.40	0.00 (0.985)	3.93±0.41	1.79 (0.183)
Married	14.65±2.87		3.30±0.45		4.04±0.42	
Education						
Diploma	13.43±3.55	2.54 (0.083)	3.28±0.50	0.04 (0.963)	3.94±0.48	.011 (0.897)
Bachelor	14.23±2.81		3.30±0.40		3.97±0.42	
≥Master grade	15.50±2.25		3.32±0.44		3.93±0.39	
Religion						
Yes	14.64±2.85	0.84 (0.402)	3.25±0.41	1.20 (0.700)	3.97±0.45	0.26 (0.795)
No	14.23±2.74		3.34±0.41		3.95±0.38	
Clinical experience (yr)						
≤2 ^a	14.32±2.46	3.09 (0.029)	3.35±0.43	0.43 (0.734)	4.04±0.38	0.78 (0.507)
3~5 ^b	13.61±3.16	d>c>a, b*	3.33±0.35		3.91±0.38	
6~10 ^c	14.93±2.40		3.26±0.48		3.99±.049	
≥11 ^d	15.69±2.41		3.24±0.39		3.90±0.33	
Working unit						
Medical ward ^a	14.49±2.71	0.30 (0.740)	3.27±0.42	1.81 (0.168)	4.01±0.39	5.80 (0.004)
Surgical ward ^b	14.21±3.31		3.43±0.34		3.67±0.46	a,c>b
Other ^c	13.60±2.70		3.49±0.27		3.98±0.16	
Education of life-sustaining treatment						
Yes	14.79±2.84	2.03 (0.044)	3.23±0.42	2.50 (0.014)	3.91±0.43	1.75(0.083)
No	13.77±2.59		3.42±0.38		4.04±0.36	
Experience of life-sustaining nursing care						
Yes	14.57±2.66	1.95 (0.053)	3.30±0.41	0.35 (0.731)	3.95±0.42	0.81 (0.419)
No	13.00±3.58		3.26±0.42		4.05±0.35	
Experience of a patient's death						
Yes	14.54±2.76	1.24 (0.217)	3.32±0.42	1.71 (0.089)	3.96±0.43	0.23 (0.817)
No	13.68±2.91		3.15±0.32		3.98±0.33	
Experience of a family member's or acquaintance's death						
Yes	14.34±2.77	0.64 (0.519)	3.28±0.42	1.12 (0.265)	3.94±0.42	1.35 (0.179)
No	14.75±2.89		3.38±0.37		4.06±0.39	

Analyzed by the independent t-test and one-way ANOVA. The post-hoc test used the Scheffé test.
*a, b, c, d=Scheffé post hoc.

4. Differences in subdomains of life-sustaining treatment nursing stress according to general characteristics

Table 5 presents differences in the subdomains of LST nursing stress according to the general characteristics of the par-

ticipants. Specifically, “burden of LST care” (F=3.32, P=0.039) and “experience of mental exhaustion” (F=6.32, P=0.002) showed significant differences between working units, and nurses in internal medicine wards and other wards (pediatric wards and integrated wards of internal medicine and surgery) were found to bear a greater burden of LST care compared to

Table 5. Differences in Sub-scores of Nursing Stress Related to Life-Sustaining Treatment by Nurses' General Characteristics. (N=132)

Variables	Burden of LST care	Experience of mental exhaustion	Conflict with a LST pt's family	Burden of operating LST equipment	Compassion for LST patients	Dilemma related to LST extension or cessation
Gender						
Male	3.67±1.28	3.50±0.98	3.89±0.19	4.17±0.29	4.33±0.67	4.22±0.69
Female	3.74±0.68	3.83±0.52	4.20±0.46	4.07±0.72	4.39±0.46	3.87±0.55
t (P)	-0.17 (0.863)	-1.08 (0.284)	-1.17 (0.246)	0.23 (0.816)	-0.19 (0.851)	1.09 (0.278)
Age (yr)						
≤25 ^a	3.76±0.56	3.78±0.56	4.12±0.43	4.27±0.58	4.32±0.40	3.86±0.41
26~29 ^b	3.66±0.69	3.80±0.47	4.22±0.38	4.09±0.64	4.36±0.49	3.93±0.60
≥30 ^c	3.79±0.79	3.90±0.58	4.23±0.57	3.87±0.85	4.47±0.49	3.84±0.62
F (P)	0.46 (0.631)	0.58 (0.559)	0.75 (0.474)	3.34 (0.039)	1.26 (0.287)	0.33 (0.721)
				a>b>c*		
Marital status						
Single	3.70±0.69	3.79±0.55	4.14±0.44	4.11±0.71	4.39±0.47	3.85±0.57
Married	3.82±0.67	3.94±0.48	4.34±0.49	3.96±0.70	4.36±0.47	3.96±0.51
t (P)	0.76 (0.385)	2.28 (0.134)	4.80 (0.030)	1.23 (0.270)	0.09 (0.761)	1.03 (0.311)
Education						
Diploma	3.82±0.63	3.84±0.59	4.07±0.45	4.14±0.38	4.10±0.50	3.86±0.57
Bachelor	3.75±0.70	3.82±0.57	4.21±0.46	4.13±0.71	4.37±0.47	3.89±0.56
≥Master grade	3.65±0.66	3.86±0.34	4.19±0.49	3.81±0.75	4.51±0.42	3.83±0.54
F (P)	0.25 (0.778)	0.08 (0.924)	0.28 (0.756)	1.99 (0.141)	2.34 (0.100)	.010 (0.902)
Religion						
Yes	3.76±0.69	3.82±0.56	4.24±0.48	4.09±0.70	4.40±0.48	3.83±0.63
No	3.71±0.69	3.83±0.51	4.16±0.44	4.05±0.72	4.37±0.46	3.92±0.49
t (P)	0.39 (0.700)	-0.13 (0.896)	0.99 (0.323)	0.31 (0.759)	0.26 (0.798)	-0.93 (0.355)
Clinical experience (yr)						
≤2 ^a	3.90±0.62	3.90±0.54	4.25±0.40	4.24±0.52	4.33±0.54	3.87±0.44
3~5 ^b	3.65±0.67	3.77±0.55	4.11±0.43	4.21±0.68	4.33±0.44	3.88±0.58
6~10 ^c	3.76±0.77	3.84±0.58	4.27±0.53	3.99±0.73	4.52±0.48	3.90±0.62
≥11 ^d	3.69±0.62	3.87±0.27	4.20±0.47	3.59±0.82	4.27±0.33	3.81±0.50
F (P)	0.78 (0.509)	0.39 (0.759)	1.08 (0.361)	3.99 (0.009)	1.75 (0.160)	0.11 (0.957)
				a,b>c>d		
Working unit						
Medical ward ^a	3.80±0.68	3.89±0.50	4.23±0.46	4.13±0.69	4.39±0.45	3.92±0.56
Surgical ward ^b	3.37±0.72	3.44±0.61	3.96±0.45	3.76±0.86	4.35±0.57	3.68±0.53
Other ^c	3.70±0.37	3.85±0.43	4.40±0.32	4.10±0.22	4.33±0.41	3.73±0.28
F (P)	3.32 (0.039)	6.32 (0.002)	3.44 (0.035)	2.14 (0.122)	0.09 (0.912)	1.63 (0.200)
	a,c>b	a,c>b	a,c>b			
Education of LST						
Yes	3.67±0.74	3.78±0.53	4.18±0.50	3.96±0.78	4.38±0.46	3.83±0.61
No	3.85±0.58	3.91±0.53	4.22±0.40	4.26±0.52	4.39±0.49	3.96±0.43
t (P)	-1.41 (0.160)	-1.30 (0.196)	-0.43 (0.667)	-2.34 (0.021)	-0.10 (0.926)	-1.32 (0.188)
Experience of life-sustaining nursing care						
Yes	3.72±0.70	3.82±0.55	4.19±0.46	4.03±0.71	4.40±0.45	3.89±0.56
No	3.89±0.58	3.92±0.38	4.27±0.50	4.42±0.61	4.26±0.60	3.77±0.50
t (P)	-0.88 (0.381)	-0.69 (0.494)	-0.60 (0.548)	-1.90 (0.060)	1.04 (0.302)	0.74 (0.460)
Experience of a patient's death						
Yes	3.73±0.71	3.83±0.53	4.20±0.47	4.01±0.73	4.39±0.50	3.90±0.57
No	3.78±0.58	3.80±0.54	4.18±0.45	4.45±0.47	4.37±0.22	3.75±0.42
t (P)	-0.28 (0.777)	0.27 (0.787)	0.12 (0.907)	-2.54 (0.012)	0.16 (0.877)	1.12 (0.264)
Experience of a family member's or acquaintance's death						
Yes	3.69±0.69	3.80±0.54	4.20±0.46	4.02±0.73	4.38±0.49	3.87±0.58
No	3.96±0.65	3.94±0.49	4.16±0.47	4.29±0.59	4.40±0.37	3.90±0.44
t (P)	-1.78 (0.078)	-1.18 (0.239)	0.42 (0.675)	-1.69 (0.094)	-0.22 (0.827)	-0.25 (0.806)

Analyzed by the independent t-test and one-way ANOVA. The post-hoc test used the Scheffé test.

LST: Life sustaining treatment, pt's: patient's.

*a, b, c, d=Scheffé post hoc.

those in surgical wards.

In the “conflict with a LST patient’s family” subdomain, significant differences were observed according to marital status ($F=4.80, P=0.003$) and working unit ($F=3.44, P=0.035$). It was found that married nurses experienced more stress than their single counterparts. In line with other areas, nurses working in internal medicine wards and other wards (including pediatric wards and integrated wards of internal medicine and surgery) had higher stress levels than those in surgical wards.

For the subdomain of “burden of operating LST equipment,” age ($F=0.75, P=0.039$), clinical experience ($F=3.99, P=0.016$), education on LST ($F=-2.34, P=0.021$), and the experience of patient deaths ($F=-2.54, P=0.012$) showed significant differences. The group aged 25 or younger reported the highest level of stress, followed by those aged 26~29, and then those aged 30 and older. Furthermore, those with 5 years or less of clinical experience reported the highest level of stress when operating LST equipment, followed by those with 6~10 years of experience, and then those with 11 or more years of experience. Nurses who had not received education on LST and those who had not experienced patient deaths reported feeling more pressure when operating LST equipment compared to their counterparts.

5. Correlations among knowledge, attitudes, and nursing stress of participants related to life-sustaining treatment

Table 6 shows the correlations among the participants’ knowledge, attitudes, and nursing stress related to LST. There was no significant correlation found between knowledge and

nursing stress concerning LST, nor between attitudes and nursing stress about LST. However, a significant positive correlation was observed between “dilemma related to LST extension or cessation,” a subdomain of nursing stress, and attitudes toward LST ($r=0.260, P=0.003$).

DISCUSSION

The study was conducted to investigate the levels of oncology nurses’ knowledge, attitudes, and nursing stress related to LST, identify the correlations among them, and provide foundational data for the development of educational programs on LST.

In this study, the mean score for the knowledge of oncology nurses regarding LST was 14.42 out of 23, which is equivalent to 62.7 out of 100. This was lower than the converted score (67) of Park’s study [23] conducted among admission ward nurses during the development stage of the scale. Moreover, it was lower than the converted score (71) of a previous study on ICU nurses [14], although it is difficult to compare it directly to the findings of this study since that study used a different scale. The previous studies that explored the knowledge about the advance directives had converted scores of 50 [9] and 83.1 [22], respectively, showing substantial variation. In our study, we found that knowledge about LST was higher among participants who had received LST education and those with more extensive clinical experience. This finding aligns with previous studies [14,23] and is also similar to a study [9] that found a correlation between higher age and increased knowledge about advance directives. These results may suggest that nurses with

Table 6. Correlations among Knowledge, Attitudes, Nursing Stress Related to Life-Sustaining Treatment (N=132).

Variables	Knowledge	Attitudes
Attitudes	-0.048 (0.582)	-
Nursing stress (Total)	0.151 (0.083)	0.035 (0.691)
Burden of LST care	0.116 (0.184)	-0.041 (0.641)
Experience of mental exhaustion	0.149 (0.088)	-0.023 (0.791)
Conflict with a LST pt’s family	0.168 (0.054)	-0.002 (0.981)
Burden of operating LST equipment	-0.004 (0.966)	-0.021 (0.814)
Compassion for LST patients	0.074 (0.401)	0.168 (0.055)
Dilemma related to LST extension or cessation	0.078 (0.376)	0.260 (0.003)

Analyzed by Pearson’s correlation coefficient.
LST: Life sustaining treatment, pt’s: patient’s.

more clinical experience and LST education have had more exposure to LST situations, leading to a greater understanding of the subject.

In addition, the items related to the application and understanding of the LST system showed low percentages of correct answers (30% or less). The items included “People with intellectual disabilities or mild dementia who can express their opinions can draw up a life-prolonging medical plan,” “Currently, if a patient cannot express his or her opinion and cannot confirm the patient’s opinion on LST, the immediate family members who decide LST are parents, children, and siblings.” and “Continuous vegetative and brain death patients are subject to reservation or suspension of LST.” These items are all related to nurses’ understanding of the LST system and the knowledge of relevant laws, as found in a previous study [23]. This finding also aligns with earlier studies indicating a lack of detailed knowledge and understanding of LST laws [8,14,22]. As this knowledge forms a legal basis, it is crucial that not only physicians who obtain consent but also nurses who care for patients have accurate understanding of it. Therefore, it is essential to develop and implement educational programs that offer direct/indirect experiences to enhance knowledge about LST, provide nurses with opportunities to expand their understanding of LST, and regularly educate them on the specific legal guidelines for LST and necessary documentation to stay updated with new amendments.

The mean score for the attitudes of oncology nurses regarding LST was 3.29 out of 5 in this study. This is similar to the scores of 3.40 in Kim’s study [8], 3.33 in Lee’s study [12], 3.25 in the study of Um et al. [16], and 3.33 in Lee and Kim’s study [15], which were all obtained using the same scale. These results suggest that nurses generally hold negative attitudes toward LST, but are supportive of discontinuing LST when it is deemed futile. Among the items assessing attitudes toward LST, the statement “A patient has a right to choose withdrawal of LST” received the highest score of 4.58. This suggests that the study participants believe in respecting patient autonomy when it comes to decisions about discontinuing or extending LST. This finding aligns with a previous study [25], which found a positive correlation between nurses’ support for LST withdrawal and their recognition of patient autonomy [25]. Furthermore, this study revealed that nurses with prior

experience in LST nursing tend to have more positive attitudes toward discontinuing LST. This is consistent with a previous study [26], which found that education on advance directives positively influenced nursing students’ attitudes toward LST withdrawal. Another study [27] also reported a positive correlation between a higher level of knowledge about LST and a more positive attitude toward its withdrawal. Therefore, it is crucial to provide education to nurses to foster positive attitudes toward LST withdrawal. If such education is incorporated during undergraduate studies or the early stages of their careers, it is anticipated that nurses will develop more positive attitudes when they encounter the LST process in their practice.

The mean score for the nursing stress of the participants in this study regarding LST was 3.96 out of 5. This is higher than the scores of 3.78 in Lee’s study [12], 3.73 in Lee and Kim’s study [15], and 3.74 in the study of Um et al. [16], which were all obtained using the same scale for ICU nurses or general nurses. The higher stress levels in this study could be attributed to ward nurses’ unfamiliarity with operating LST equipment compared to ICU nurses. Additionally, the presence of patient guardians may lead to more frequent conflicts, adding to the nurses’ stress. Significant differences were also observed in LST-related nursing stress across different working units. Nurses in the internal medicine ward, the integrated ward of internal medicine and surgery, and the pediatric ward reported higher stress levels than those in surgical wards. This could be related to the findings of a previous study [28], which reported that 93.1% of internal medicine residents and 47.4% of surgical residents had completed the LST withdrawal form. This suggests that there are more patients requiring LST in internal medicine wards than in surgical wards. Patients in these wards are often elderly or suffer from chronic diseases, leading to a high dependency on care. The increased use of LST equipment in these wards can result in an excessive workload, thereby increasing the stress levels among nurses.

Upon analyzing the subdomains of LST nursing stress, it was found that compassion for LST patients scored the highest at 4.38. This was followed by a score of 4.20 for conflict with an LST patient’s family, and 4.07 for the burden of operating LST equipment. These results align with previous studies [12,29], suggesting that nurses experience the most stress when their

patients are in challenging situations due to their empathetic nature. Furthermore, it appears that oncology nurses face more stress factors. This is likely because they care for a larger number of patients than ICU nurses, have relatively limited time for LST patients, encounter more conflicts with guardians staying at the hospital, and are less familiar with operating LST equipment.

Our analysis of the individual categories of LST nursing revealed that “unclear orders from a doctor” received the highest score of 3.50. This was closely followed by “a family focusing on non-priorities during a patient’s LST emergency.” These results align with a study conducted by Lee [12], suggesting that nurses experience stress when trust is eroded due to communication issues among medical staff and conflicts with patient guardians arising from ambiguous LST decisions. Consequently, to alleviate the stress associated with LST nursing, it is deemed necessary to implement educational programs on specialized medical equipment. Additionally, guidelines for communication among medical staff in the context of LST and strategies for managing conflicts with patient guardians are needed to foster a sense of trust.

In this study, we found no significant correlation between knowledge, attitudes, and nursing stress related to LST. This contrasts with a previous study [14], which found that a higher level of knowledge among ICU nurses about LST decisions correlated with more positive attitudes toward the withdrawal of LST. This discrepancy may be due to the fact that even when oncology nurses acquire knowledge about LST, it is not always effectively implemented in clinical practice. This can make it difficult for them to form attitudes toward LST, resulting in no correlation between their knowledge and attitudes on the subject. Furthermore, we found no significant correlation between attitudes toward LST and nursing stress related to LST. This is consistent with previous studies [12,15,19]. However, our findings conflict with those of another previous study [30], which found that a lower terminal patient care capacity correlated to a higher level of stress. Since the score for LST nursing stress in this study was 3.96, which is higher than the mean score of 2.5, it appears that oncology nurses experience stress related to LST regardless of their knowledge or attitudes toward it. This could be due to a variety of stress factors, including difficulties in communication related to terminal

patient care, administrative tasks associated with implementing the Act on Decisions on LST, and confusion about the role of nurses, which is not clearly defined in the Act on Decisions on Life-Sustaining Treatment [30]. Nonetheless, as this is a single study conducted at one institution, the relationships between these variables need to be further explored in future studies.

In the correlation analysis of LST nursing stress subdomains, there was a positive correlation between attitudes toward LST and “dilemma related to LST extension or cessation.” This suggests that a more positive attitude toward the withdrawal of LST is associated with higher stress levels in dilemmatic situations related to LST. While education about life-sustaining treatments can positively influence nurses’ attitudes toward LST withdrawal, it’s important to note that nurses often experience increased stress in dilemmatic situations related to LST. Therefore, it would be beneficial to incorporate various potential dilemmas nurses may encounter, solutions to these situations, and stress reduction techniques into related educational programs.

There are limitations to generalizing the results of this study because it was conducted on oncology nurses at a university hospital. Nevertheless, the study holds significance as it explores the practical knowledge levels about LST among oncology nurses who care for LST patients, a need that arises from the growing patient population. Furthermore, this study yields valuable insights by identifying the levels and factors of stress related to LST among oncology nurses, achieved through a subdomain-level analysis. It is anticipated that the findings of this study will contribute to the development of educational programs on LST for oncology nurses, thereby aiding in the establishment and implementation of the Act on Decisions on Life-Sustaining Treatment.

Based on the findings of this study, we suggest the following. First, replication studies are necessary to explore the knowledge, attitudes, and stress levels of nurses in relation to LST. These studies should also re-examine the correlation between these factors, incorporating a larger number of work units and participants. Additionally, we need to develop comprehensive educational programs for nurses responsible for LST patients. These programs should cover documentation and legal considerations in the decision-making process for LST, strategies for managing conflicts with patients and their guardians, and

training on the use of related medical equipment. Lastly, we should conduct intervention studies to identify the various factors that influence the stress levels of oncology nurses in relation to LST. These studies should analyze nursing stress at the subdomain level, with the ultimate goal of reducing the stress experienced by nurses in the context of LST.

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CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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AUTHOR'S CONTRIBUTIONS

Conception or design of the work: SH. Data collection: SP. Data analysis and interpretation: SL, SP. Drafting the article: SL. Critical revision of the article: SP, SL. Final approval of the version to be published: SL.

SUPPLEMENTARY MATERIALS

Supplementary materials can be found via <https://doi.org/10.14475/jhpc.2023.26.3.112>.

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