

Decision-making Support by Nursing Professionals for Older Patients Undergoing Maintenance Hemodialysis and the Associated Factors

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Abstract

Background: We aimed to clarify the nature of decision-making support provided by nursing professionals for older patients undergoing maintenance hemodialysis and identify associated factors.

Methods: Nurses with at least 2 years of clinical experience who routinely provided care to older patients receiving maintenance hemodialysis were recruited. Data were collected from 337 nurses using an online self-administered questionnaire covering basic attributes, status of shared decision-making (SDM)/advance care planning (ACP) implementation at affiliated institutions, day-to-day ACP support, a revised Nurses' Ethical Behavior Scale, and the Nursing Practice Scale for Treatment and Care Policies for Terminal-Stage Patients on Maintenance Hemodialysis.

Results: Decision-making support was associated with basic attributes, including years of experience in dialysis nursing, position, affiliation, dialysis-related qualifications, SDM/ACP implementation status, day-to-day ACP support, and ethical behavior. Multiple regression analysis showed significant positive effects of years of dialysis nursing experience, SDM/ACP implementation status (will avoid dialysis based on agreement with patients and their family members if they have chosen conservative kidney management.), day-to-day ACP support (being conscious of ACP when conversing with patients who have asked for a consultation, engaging in discussion after finding out what patients value through communication with patients, and utilizing the Four Quadrants Approach described by Jonsen), and ethical behavior. In contrast, the age and status of SDM/ACP implementation at affiliated institutions (will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision-making ability). had a significant negative impact. Decision-making support for older patients undergoing maintenance hemodialysis should begin while patients and families can still engage in ACP discussions, rather than after patients lose decision-making ability.

Conclusion: Decision-making support for older patients undergoing maintenance hemodialysis require strengthened nursing education to promote ethical behavior and improved ACP support by nursing professionals and multidisciplinary medical teams.

Introduction

In Japan, the aging and prolonged duration of chronic dialysis patients are increasing [1, 2], and maintenance hemodialysis accounts for over 90% of renal replacement therapies [1]. Early end-of-life care is required to anticipate the possibility of multiple comorbidities, such as renal failure, heart failure, dementia, and malignant tumors due to aging, as well as the potential for sudden death [2-4]. Among older patients with chronic kidney disease who have various complications and cognitive decline, dialysis initiation and continuation are often challenging in this population, and some patients subsequently discontinue treatment [3,5]. Recommendations on the Decision-Making Process for Initiating and Continuing Dialysis" (hereafter referred to as Recommendations), revised by the Japanese Society for Dialysis Therapy in 2020 [6], outlines a shared decision-making (SDM) process. This process involves discussions among patients, family members, and the medical team regarding the desired medical interventions during the final stages of life, supporting decision-making through consensus building [6]. Furthermore, in older patients with chronic kidney disease who have various complications and cognitive decline, conservative kidney management (CKM), centered on symptomatic treatment and palliative care rather than hemodialysis, has been reported to be more beneficial for survival, functional prognosis, and quality of life [5-7]. Therefore, when making decisions regarding the initiation and continuation of renal replacement therapy, healthcare teams should consider providing the

best possible medical care and support, as well as establishing optimal palliative care and support for older patients with renal failure. From the perspective of physical decline and prognosis in older patients, CKM should be proposed in addition to renal replacement therapy [3,6]. For older patients with chronic kidney disease, while promoting SDM, which is defined as "a process in which patients, families, and the healthcare team repeatedly discuss evidence-based medical information, the healthcare team's recommendations, and the patient's values, intentions, and concerns to reach the best possible medical and care decisions for the patient" [6], Advance care planning (ACP) is also being promoted [6,7]. ACP is "a process in which patients, families, and healthcare providers discuss in advance the sharing of values and preferences regarding future treatment, care, and convalescence, and designate a proxy decision-maker in preparation for a future decline in decision-making ability" [8]. Both SDM and ACP have been actively promoted in recent years [6,7,9,10].

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However, a 2020 survey on the suspension of dialysis and related matters conducted among facilities that had requested statistical surveys from the Japanese Society for Dialysis Therapy reported that only about half of the surveyed facilities indicated that they had systems in place for SDM and ACP [9]. Dialysis therapy is a life-prolonging treatment in which discontinuation leads to death within days to weeks [11], and withholding or interrupting dialysis can directly affect life support. Furthermore, over 90% are older adults, with more than 60% having impaired comprehension or cognitive function, and over 50% lacking decision-making ability. Compared with previous survey results, an increase in patients requiring decision support has also been confirmed [9,12]. This finding suggests that ethical issues exist in the decision-making process regarding the initiation and continuation of dialysis in older patients with chronic kidney disease.

Ando et al. demonstrated that Nursing Practice for Treatment and Care Policies for Terminal-Stage Patients on Maintenance Hemodialysis, as reported by nurses working in dialysis departments, comprised five factors: bridging communication with physicians, facilitating consensus building, supporting decision formation, supporting the expression of wishes, and symptom management. [13] Furthermore, they clarified that nursing practices for treatment and care policies for terminal-stage patients on maintenance hemodialysis were associated with organizational citizen behavior, organizational climate, and knowledge of ethics. [14] Previous studies indicate that older patients undergoing maintenance hemodialysis often resist explicit discussions of death due to its unpredictability. Nurses also reported feeling that dialysis treatment may diminish the quality of the final days of older patients and cause them suffering [15]. Decision-making support that respects the wishes of older patients regarding the withdrawal of maintenance hemodialysis requires continuous nursing support for older patients and their families, who may experience emotional fluctuations even after a treatment decision has been made [16]. Furthermore, addressing nurses' dilemmas and ambiguities requires confronting the patients' true feelings [17]. In maintenance hemodialysis, where healthcare providers interact with numerous dialysis patients over extended periods, ethical behaviors such as safeguarding patient safety and providing optimal and equitable care are essential [18].

Previous studies on ethical behavior among nurses have examined the relationship between nursing practice for older patients with cancer and dementia receiving treatment in acute care hospitals, years of nursing experience, years of nursing care for older patients with cancer and dementia, participation in study groups/training seminars on dementia, knowledge of dementia, status of nursing practice for dementia, and ethical behavior [19]. Furthermore, the relationship between the ethical behavior of middle nursing managers and their participation in nursing management training, nursing ethics training, and nursing ethics conferences was clarified [20]. However, no study has reported decision support involving nurses caring for older patients undergoing maintenance hemodialysis.

Based on existing evidence, dialysis nursing experience, training participation, conference attendance, and organizational culture are associated with decision-making support from nursing professionals for older patients undergoing maintenance hemodialysis. However, this remains unclear. No previous study has reported an association with ACP support. By clarifying the relationship between decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis, the status of SDM/ACP implementation at affiliated institutions, day-to-day ACP support by nursing

professionals, and nurses' ethical behavior, we sought to demonstrate the characteristics of decision-making support by nursing professionals for older patients and to derive implications for promoting ACP. We aimed to clarify the decision-making support provided by nursing professionals to older patients undergoing maintenance hemodialysis and its associated factors.

Definition of terms

Referencing Ando et al.'s "Nursing Practice Scale for Treatment and Care Policies for Terminal-Stage Patients on Maintenance Hemodialysis"[13], we defined decision-making support provided by nurses to older patients undergoing maintenance hemodialysis as "striving to promote mutual understanding between patients/families and physicians, confirming whether any discrepancies exist in the recognition of the patient's condition and treatment plan, and striving to facilitate consensus-building within the medical team to align with the patient's wishes."

Participants and Methods

Target individuals

The participants were nurses employed at 83 of 239 hemodialysis facilities in the six prefectures of the Tohoku region who provided consent for the study. Information on these hemodialysis facilities was obtained until March 2024 from the Japanese Society for Dialysis Therapy's certified facilities and education-related facilities [21], the Japanese Society of Nephrology's certified education facilities [22], and the Ministry of Health, Labour and Welfare's website [23].

Nurses were involved in the care of older patients undergoing maintenance hemodialysis, with at least 2 years of practical nursing experience, who routinely provide care to such patients in dialysis rooms, dialysis centers, blood purification therapy rooms, inpatient wards, outpatient clinics, or clinics.

Survey Period

April through May of 2024.

Survey Method

A self-administered questionnaire survey was conducted online (hereafter referred to as the "web survey"). A research explanation document outlining the purpose of this study was mailed and cooperation from the nursing administrators of the target facilities was requested, inquiring about their willingness to participate in the study. The following was mentioned: "If you can cooperate with this study, please fill in the number of nurses available to assist with the enclosed Research Cooperation Consent Form and return it using an enclosed return envelope." Subsequently, a specified number of copies of the research explanation documents for the designated nurses were mailed to the nursing manager or the designated contact person, requesting their distribution to the target nurses. Responses were obtained through a web survey by having the target nurses access the QR code or URL provided in the research explanation document.

Survey content

Basic attributes

Age, sex, highest level of education, profession, years of nursing experience, years of experience in dialysis nursing, position, qualifications related to dialysis, affiliation, dialysis facility, and learning experience related to dialysis nursing were recorded.

Status of SDM/ACP implementation at the affiliated institutions

Based on the recommendations of the Japanese Society for Dialysis Therapy [6], eight items were developed to assess the Status of SDM/ACP implementation in affiliated institutions: is implementing SDM has created documents based on repeated discussions by medical care teams with patients and their family members to prepare for future deterioration in decision-making ability accepts requests to avoid dialysis from patients with decision-making ability accepts requests to avoid dialysis from family members of patients who do not have decision-making ability will avoid dialysis based on agreement with patients and their family members, if they have chosen conservative kidney management will make a proposal, via the medical team, to avoid dialysis to patients who have decision-making ability, will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision-making ability will try to shape an agreement through repeated discussions if agreement to avoid dialysis cannot be reached among patients, their family members, and the medical care team. For each item, their level of engagement was confirmed using a four-point scale: “Not at all,” “Hardly ever,” “Occasionally,” and “Frequently.”

Day-to-day ACP support by nursing professionals

Based on the recommendations of the Japanese Society for Dialysis Therapy [6], Ministry of Health, Labour and Welfare's “Guidelines on the Decision-Making Process for Medical Care and Support in the Final Stage of Life” [24], the Japan Nursing Association's “Code of Ethics for Nurses” [25], and the Japanese Geriatrics Society's “Recommendations on Promoting Advance Care Planning” [26], six items were developed for day-to-day ACP support by nursing professionals: voluntarily approaching patients who are in need of ACP being conscious of ACP when conversing with patients who have asked for a consultation engaging in discussion after finding out what patients value through communication with patients participating in regular conferences with the medical care team participating in regular case study sessions with the medical care team and utilizing the Four Quadrants Approach described by Jonsen For each item, their level of engagement was confirmed using a four-point scale: “Not at all,” “Hardly ever,” “Occasionally,” and “Frequently.”

Nurses' ethical behavior

The 15-item “Revised edition of the nurses' ethical behavior Scale” developed by ODE was used [18]. This scale consists of 15 items across three factors: “risk avoidance” (5 items), “good care” (5 items), and “fair care” (5 items). Each item was scored from 1 point “does not apply at all” to 6 points “applies very much,” and the total score was calculated. The score ranged from 15 to 90 points, with a higher total score indicating a greater ability to engage in ethical behavior. The Cronbach's alpha coefficient for the entire scale was 0.84, confirming its reliability and validity [18]. Cronbach's alpha coefficient in this study was 0.809. Permission to use the scale was obtained from its developer.

Decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis

When deciding on the initiation and continuation of renal replacement therapy, it is necessary to consider the physical decline and life prognosis of older patients [6] to ensure that healthcare teams provide optimal medical care and support. Therefore, the “Nursing Practice Scale for Treatment and Care Policies for Terminal-Stage

Patients on Maintenance Hemodialysis” developed by Ando et al. was utilized [13]. This scale consists of 19 items across five factors: “bridge between patients and physicians” (6 items), “facilitating consensus building”(3 items), “support for forming one's preferences”(3 items), “support for expressing patient preferences”(3 items), and “support for symptom management” (4 items). For each item, a score ranging from 0 points for “not done” to 3 points for “done” was assigned and the total score was calculated. The score ranged from 0 to 57 points, with higher total scores indicating greater implementation. The Cronbach's alpha coefficient for the entire scale was 0.940, confirming its reliability and validity [13]. The Cronbach's alpha coefficient in this study was 0.943. Permission to use the scale was obtained from its developer.

Pre-test

A pre-test was conducted with three graduate students and six nurses with 17–36 years of experience, who routinely provided dialysis care. They were asked whether any expressions in the questionnaire were unclear and how easy they were to answer. The questionnaire was revised based on the feedback and used in this study.

Analytical methods

Based on the normality test, a nonparametric method was selected. The nursing practice scale developed by Ando et al. [13] for Nursing Practice Scale for Treatment and Care Policies for Terminal-Stage Patients on Maintenance Hemodialysis was used as the dependent variable for decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis. The independent variables were the basic attributes of nursing professionals: status of SDM/ACP implementation at affiliated institutions, day-to-day ACP support provided by nursing professionals, and the ethical behavior of nursing professionals. For intergroup comparisons, the Mann-Whitney U test was used, and for the correlation between variables, Spearman's rank correlation coefficient was used. The interpretation of the correlation coefficient was determined as $\rho = 0.7-0.4$ indicating a fairly strong correlation [27]. To examine decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and its associated factors, we performed a multiple regression analysis with forced inclusion of variables showing significance at a probability of less than 10%. When diagnosing multicollinearity, values exceeding 10 for the variance inflation factor (VIF) suggest multicollinearity [27]. However, in this study, we confirmed that the VIF values were 10 or below. Furthermore, the analysis of variance (ANOVA) results confirmed a significance probability of $p < 0.001$, with each independent variable having a significance probability of $p < 0.05$. Statistical analyses were performed using IBM SPSS Statistics Version 27.0.

Ethical Considerations

This study was conducted with the approval of the Ethics Review Committee of the Faculty of Medicine, Yamagata University (Approval No. 2024-2).

The surveys were conducted anonymously. The participants were informed in writing that cooperation was voluntary, that no disadvantage would result from declining to participate, that neither facilities nor individuals would be identified, and that the data collected via the web survey would be subject to strict security management to prevent data breach. Furthermore, regarding consent,

a checkbox was included in the consent confirmation section during initial data entry, and the system was configured such that only those who checked the box could submit their responses. A written explanation was provided stating that due to the anonymous nature of the survey, consent could not be withdrawn after responses were submitted, even if withdrawal was desired.

Results

Research information packets were mailed to 83 facilities that responded to the nursing administrators' requests for research cooperation, and the packets were distributed to 779 participants. The study population comprised 344 respondents (response rate: 44.2%) who completed the web survey. After excluding seven respondents with incomplete responses, the final sample comprised 337 individuals (valid response rate: 98.0%).

1. Basic attributes (Table 1)

The participants had an average age of 45.2 ± 9.3 years, an average of 21.8 ± 9.6 years of nursing experience, and an average of 9.6 ± 7.3 years of experience in dialysis nursing.

The median total score for the 15-item revised edition of the Nurses' Ethical Behavior Scale was 68 (range: 62–73).

2. Decision-making support from nursing professionals for older patients undergoing maintenance hemodialysis (Table 2)

The median total score for the 19-item "Nursing Practice Scale for Treatment and Care Policies for Terminal-Stage Patients on Maintenance Hemodialysis" was 35 (range 25–44), indicating decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis.

3. Association between decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and the basic attributes of nursing professionals (Table 3)

Results confirmed the relationship between decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and their basic attributes revealed significant differences in years of experience in dialysis nursing, position, affiliation, and qualifications related to dialysis.

4. Association between decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and the status of SDM/ACP implementation at affiliated institutions, day-to-day ACP support by nursing professionals, and ethical behavior of nursing professionals (Table 4)

Table 1: Basic attributes.

		N=337	
		Mean	± SD
Age		45.2	± 9.3
Years of nursing experience		21.8	± 9.6
Years of experience in dialysis nursing		9.6	± 7.3
		n	(%)
Sex	Male	33	(9.8)
	Female	304	(90.2)
Highest level of education	vocational school	282	(83.7)
	Junior College	19	(5.6)
	University	22	(6.5)
	Graduate School	3	(0.9)
	Other	11	(3.3)
Profession	Registered Nurse	303	(89.9)
	Practical Nurse	25	(7.4)
	Public Health Nurse	9	(2.7)
Position	Staff	198	(58.8)
	Assistant Nurse Manager Senior Nurse	90	(26.7)
	Nurse Manager Section Chief	49	(14.5)
Affiliation	dialysis rooms, dialysis centers, blood purification therapy rooms	251	(74.5)
	inpatient wards	47	(13.9)
	outpatient clinics	36	(10.7)
	Other	3	(0.9)
Dialysis facility	University Hospital	12	(3.6)
	National and public hospitals	52	(15.4)
	Hospital affiliated with social insurance organizations	19	(5.6)
	Other Hospitals	180	(53.4)
	Private Practitioners and Clinics	74	(22.0)
Qualification related to dialysis	Yes	40	(11.9)
	No	297	(88.1)
Learning experience related to dialysis nursing	Yes	247	(73.3)
	No	90	(26.7)

Significant positive correlations were observed between decision-making support for older patients undergoing maintenance hemodialysis and the status of SDM/ACP implementation at affiliated institutions, all items of day-to-day ACP support provided by nursing professionals, and nurses' ethical behavior.

5. Multiple regression analysis of decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and the associated factors (Table 5)

Multiple regression analysis was performed, with decision-making support from nursing professionals for older patients undergoing maintenance hemodialysis as the dependent variable. Age and items significantly associated with it at a 10% probability level were forcibly included as independent variables. The items were: years of experience in dialysis nursing, position, affiliation, qualification related to dialysis, status of SDM/ACP implementation at affiliated institutions (8 items); day-to-day ACP support by nursing professionals (6 items); and ethical behavior of nursing professionals (coefficients of determination $R = .761$, $R^2 = 0.579$; adjusted $R^2 = 0.552$). The ANOVA test result was $p = 0.000$. The items showing a significant positive effect were as follows:

Table 2: Decision-making support from nursing professionals for older patients undergoing maintenance hemodialysis

N=337			
	Interquartile Range		
	Median	25%	75%
Bridge between patients and physicians	13	8	17
Facilitating consensus building	3	2	6
support for forming one's preferences	5	3	7
support for expressing patient preferences	5	3	7
support for symptom management	9	7	11
total score	35	25	44

Nursing Practice Scale for Treatment and Care Policies for Terminal-Stage Patients on Maintenance Hemodialysis Total score: Minimum 0 to maximum 57 (points)
 Bridge between patients and physicians: Minimum 0 to Maximum 18 (points),
 Facilitating consensus building: Minimum 0 to Maximum 9 (points),
 support for forming one's preferences: Minimum 0 to Maximum 9 (points),
 support for expressing patient preferences : Minimum 0 to Maximum 9 (points),
 support for symptom management: Minimum 0 to Maximum 12 (points)

Table 3: Association between decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and the basic attributes of nursing professionals.

N=337							
	n	Interquartile Range			Minimum	Maximum	r
		Median	25%	75%			
Age ¹⁾	337	45	40	52	22	66	-0.039
Years of nursing experience ¹⁾	337	22	15	28	2	45	0.002
Years of experience in dialysis nursing ¹⁾	337	7	3	15	2	35	0.145 **
	n	Median	25%	75%		P	
Highest level of education ³⁾	Vocational school	282	35.0	25.8	44.0		
	Junior College	19	28.0	23.0	46.0		
	University	22	32.5	23.0	41.8		
	Graduate School	3	36.0	28.0	NA		
	Other	11	36.0	27.0	42.0		
Profession ³⁾	Registered Nurse	303	35.0	25.0	45.0		
	Practical Nurse	25	35.0	25.0	39.5		
	Public Health Nurse	9	37.0	24.5	38.5		
Position ³⁾⁴⁾	Staff	198	32.0	23.0	41.0	***	***
	Assistant Nurse Manager Senior Nurse	90	37.0	29.0	47.3		**
	Nurse Manager Section Chief	49	40.0	34.0	50.5		***
Affiliation ³⁾⁴⁾	Dialysis rooms, dialysis centers, blood purification therapy rooms	251	34.0	24.0	43.0	*	*
	Inpatient wards	47	39.0	29.0	47.0		*
	Outpatient clinics	36	34.5	25.3	43.8		*
	Other	3	50.0	47.0	NA		*
	Qualification related to dialysis ²⁾	Yes	40	41.5	31.3	51.0	**
Learning experience related to dialysis nursing ²⁾	Yes	247	35.0	27.0	44.0		

*: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

1) Spearman's rank correlation coefficient, 2) Mann-Whitney U test, 3) Kruskal-Wallis test

4) For comparisons involving three or more groups, groups showing significant differences after the Kruskal-Wallis test underwent intergroup comparisons using the Mann-Whitney U test.

Note: NA: Cannot be calculated

Table 4: Association between decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and the status of SDM/ACP implementation at affiliated institutions, day-to-day ACP support by nursing professionals, and ethical behavior of nursing professionals.

			n	%	r	
						N=337
SDM/ACP implementation status at affiliated institutions	Is implementing SDM	Implemented	162	48.1	0.368	***
		Not Implemented	175	51.9		
	Has created documents based on repeated discussions by medical care teams with patients and their family members to prepare for future deterioration in decision-making ability	Implemented	114	33.8	0.320	***
		Not Implemented	223	66.2		
	Accepts requests to avoid dialysis from patients with decision-making ability	Implemented	122	36.2	0.401	***
		Not Implemented	215	63.8		
	Accepts requests to avoid dialysis from family members of patients who do not have decision-making ability	Implemented	120	35.6	0.405	***
		Not Implemented	217	64.4		
	Will avoid dialysis based on agreement with patients and their family members, if they have chosen conservative kidney management	Implemented	173	51.3	0.431	***
		Not Implemented	164	48.7		
Will make a proposal, via the medical team, to avoid dialysis to patients who have decision-making ability	Implemented	76	22.6	0.326	***	
	Not Implemented	261	77.4			
Will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision making ability	Implemented	112	33.2	0.281	***	
	Not Implemented	225	66.8			
Will try to shape an agreement through repeated discussions if agreement to avoid dialysis cannot be reached among patients, their family members, and the medical care team	Implemented	157	46.6	0.446	***	
	Not Implemented	180	53.4			
Day-to-day ACP support by nursing professionals	Voluntarily approaching patients who are in need of ACP	Implemented	130	38.6	0.439	***
		Not Implemented	207	61.4		
	Being conscious of ACP when conversing with patients who have asked for a consultation	Implemented	187	55.5	0.567	***
		Not Implemented	150	44.5		
	Engaging in discussion after finding out what patients value through communication with patients	Implemented	267	79.2	0.543	***
		Not Implemented	70	20.8		
	Participating in regular conferences with the medical care team	Implemented	223	66.2	0.351	***
		Not Implemented	114	33.8		
	Participating in regular case study sessions with the medical care team	Implemented	118	35.0	0.328	***
		Not Implemented	219	65.0		
Utilizing the Four Quadrants Approach described by Jonsen	Implemented	58	17.2	0.325	***	
	Not Implemented	279	82.8			
		Median	25	75		
Nurses' ethical behavior			68	62	73	0.464 ***

Spearman's rank correlation coefficient ***: $p < 0.001$,

Implemented group Frequently Occasionally Not Implemented group Hardly ever Not at all

years of experience in dialysis nursing, will avoid dialysis based on agreement with patients and their family members, if they have chosen conservative kidney management; being conscious of ACP when conversing with patients who have asked for a consultation; engaging in discussion after finding out what patients value through communication with patients; utilizing the Four Quadrants Approach described by Jonsen, revised edition of the nurses' ethical behavior Scale. The items showing a significant negative impact were as follows: age, will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision-making ability.

Consideration

Characteristics of the participants

The participants had an average age of 45.2 (± 9.3) years, an average of 21.8 (± 9.6) years of nursing experience, and an average of 9.6 (± 7.3) years of experience in dialysis nursing, comparable to previous studies [14]. Only 10% held qualifications related to dialysis, whereas 70% had experience in dialysis nursing. The total score for decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis was 35 points (interquartile range, 25–44

points), which is equivalent to the raw data from a previous study [13]. This suggests that they possessed extensive knowledge and experience in dialysis nursing and were actively engaged in decision-making.

At the participants' affiliated institutions, SDM implementation was observed in 48.1% of cases, and ACP implementation was observed in 40–50% of cases, showing no substantial difference from previous studies. [9] The rate of consensus building among all patients and stakeholders, not in the final stages of life, is reported to be significantly higher when SDM is fully implemented, regardless of decision-making ability [9,10]. Even for older patients receiving maintenance hemodialysis at the end of their life, SDM is crucial for supporting optimal decision making by patients, families, and others [6]. Furthermore, given the aging patient population and the current situation in which patients request the discontinuation of dialysis, decision-making support regarding the initiation and continuation of dialysis is particularly important [6]. Predicting the process of functional decline in older patients and providing ongoing ACP support through repeated discussions with nurses about the patient's desired medical and nursing care are crucial [28], necessitating the establishment of organizational support systems.

Table 5: Multiple regression analysis of decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and the associated factors.

		N=337
		β
Basic attributes	Age	-0.089 *
	Years of experience in dialysis nursing	0.160 ***
	Position ¹⁾	0.062
	Affiliation ³⁾	-0.003
	Qualification related to dialysis ²⁾	0.020
SDM/ACP implementation status at affiliated institutions	Is implementing SDM	0.033
	Has created documents based on repeated discussions by medical care teams with patients and their family members to prepare for future deterioration in decision-making ability	0.027
	Accepts requests to avoid dialysis from patients with decision-making ability	-0.081
	Accepts requests to avoid dialysis from family members of patients who do not have decision-making ability	0.114
	Will avoid dialysis based on agreement with patients and their family members, if they have chosen conservative kidney management	0.175 ***
	Will make a proposal, via the medical team, to avoid dialysis to patients who have decision-making ability	0.087
	Will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision making ability	-0.120 *
	Will try to shape an agreement through repeated discussions if agreement to avoid dialysis cannot be reached among patients, their family members, and the medical care team	0.087
Day-to-day ACP support by nursing professionals	Voluntarily approaching patients who are in need of ACP	0.013
	Being conscious of ACP when conversing with patients who have asked for a consultation	0.239 ***
	Engaging in discussion after finding out what patients value through communication with patients	0.154 **
	Participating in regular conferences with the medical care team	0.002
	Participating in regular case study sessions with the medical care team	-0.001
	Utilizing the Four Quadrants Approach described by Jonsen	0.107 *
Nurses' ethical behavior		0.270 ***
	R ²	0.579
	Adjusted R ²	0.552 ***

*: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$ [Note] Multiple regression analysis (forced inclusion method), VIF 1.112–2.839

The dummy variable was created as follows:

1) Position: Staff:1, Assistant Nurse Manager•Senior Nurse, Nurse Manager•Section Chief:2

2) Qualification related to dialysis No: 0, Yes: 1.

3) Affiliation dialysis rooms, dialysis centers, blood purification therapy rooms:1, inpatient wards, outpatient clinics, Other:2

Decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis and its associated factors

Multiple regression analysis was performed using decision-making support from nursing professionals for older patients undergoing maintenance hemodialysis as the dependent variable. Eight items related to the Status of SDM/ACP implementation at affiliated institutions, and six items related to day-to-day ACP support provided by nursing professionals, which were significant in the univariate analysis, were included in the model. As a result, the following factors showed a positive influence: “revised edition of the nurses’ ethical behavior Scale,” “being conscious of ACP when conversing with patients who have asked for a consultation,” “will avoid dialysis based on agreement with patients and their family members, if they have chosen conservative kidney management,” “years of experience in dialysis nursing,” “engaging in discussion after finding out what patients value through communication with patients,” and “utilizing the Four Quadrants Approach described by Jonsen.” In contrast, “age” and “will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision-making ability” showed a negative impact.

Relationship among the basic attributes of nursing professionals

Among the basic attributes of nursing professionals, “years of experience in dialysis nursing” showed an influence. The average number of years of experience in dialysis nursing was 9.6 years. According to Honda et al., based on the practical knowledge of nurses with over 5 years of experience working in dialysis units, “dialysis nurses have become trusted figures for patients and their families through relationships built during dialysis treatment. This end-of-life care leveraged the unique characteristics of dialysis nursing, years of interaction with patients and families, and a perspective that identifies changes within their daily lives” [15]. These findings suggest that the dialysis nurses in this study acquired the skills required for dialysis nursing practice through their experience.

Relationship with day-to-day ACP support by nursing professionals

In day-to-day ACP support by nursing professionals, the following factors showed an impact: “being conscious of ACP when conversing with patients who have asked for a consultation” and “engaging in discussion after finding out what patients value through communication with patients.” This process involves patients, families, and healthcare providers discussing their values and preferences

regarding future treatment, care, and medical decisions, including designating a proxy decision maker in preparation for a potential future decline in decision-making ability [8]. It can be inferred that many nurses consciously engaged in this practice as part of their daily work. Ogawa et al. stated that certified dialysis nurses “must understand the values and unique circumstances of older patients regarding dialysis treatment and prognosis and provide information on dialysis treatment and prognosis tailored to their values and unique circumstances” [16]. It is crucial for nurses close to the patient to understand the patient’s thoughts by drawing them out through daily interactions and to repeatedly discuss matters related to how the patient has lived, their values and beliefs, and their views on life and death. Furthermore, in day-to-day ACP support by nursing professionals the “nurses’ ethical behavior” and “utilizing the Four Quadrants Approach described by Jonsen” demonstrated a significant influence. In the recommendation [6], decision-making support for older patients who undergo maintenance hemodialysis when making decisions regarding the initiation and continuation of renal replacement therapy, the healthcare team should provide the best possible medical care and support. Considering the decline in physical function and prognosis among older adults, CKD management should be proposed as an alternative option along with renal replacement therapy. Healthcare providers’ ethical judgments influence decision-making support, making it a significant factor. Based on the above, nurses with high practical skills in decision-making support can engage in ethical behaviors. Furthermore, being conscious of ACP when conversing with patients who have asked for a consultation, engaging in discussions after finding out what patients value through communication, and utilizing the four-quadrant approach described by Jonsen. Treatment choices reflect the affiliated institution’s policy, but when patients and their families opt for conservative kidney management with the support of nurses skilled in decision-making and reach a mutual agreement, dialysis may be deferred.

Relationship with status of SDM/ACP implementation at affiliated institutions

Regarding the status of SDM/ACP implementation at affiliated institutions “will avoid dialysis based on agreement with patients and their family members, if they have chosen conservative kidney management” showed an impact. The use of recommendations [6] is left to the discretion of each facility, suggesting that organizational decisions influence the outcome.

In contrast, focusing on “will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision-making ability,” implementation was observed in only 30% of cases, indicating a relatively low rate. Recommendation [6]: When a patient is unable to express their will or lacks decision-making ability, family members or others who can infer the patient’s wishes must become surrogate decision makers in medical care and treatment. However, discussions about heirs are important. Furthermore, the assessment of the patient’s decision-making ability should be conducted by the patient, family members or others, and the medical team. When assessing decision-making ability, more time should be spent to comprehensively evaluate understanding, logical thinking, recognition, and expression. Regarding “will make a proposal, via the medical team, to avoid dialysis to family members of patients who do not have decision-making ability,” univariate analysis showed a correlation with the “Nursing Practice Scale for Treatment and Care Policies for Terminal-Stage Patients on Maintenance Hemodialysis,”

but multiple regression analysis indicated a negative impact. This suggests that in older patients undergoing maintenance hemodialysis, the proposal to withhold dialysis is not made after their decision-making ability has been lost. Therefore, for older patients undergoing maintenance hemodialysis, it is necessary to intervene at a stage when ACP discussions are possible with the patient and their family, rather than waiting until decision-making ability is lost.

Limitations and Challenges of This Study

In this study, we targeted nurses working at hemodialysis facilities across six prefectures in the Tohoku region, who provided consent to participate in the research. The response rate was 44.2%. Notably, we obtained meaningful insights regarding decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis, implementation status of SDM/ACP implementation at affiliated institutions, day-to-day ACP support by nursing professionals, and nurses’ ethical behavior. However, because the data were obtained from a limited region and the selection of research participants was entrusted to nursing managers at facilities performing maintenance hemodialysis, there is a possibility of bias toward selecting participants with a high level of interest in and extensive experience with ACP support. With the aging of patients undergoing maintenance hemodialysis, decision-making support for initiating and continuing dialysis has become an increasingly critical issue. It is anticipated that nurses will play a role in promoting ACP. It is necessary to clarify the specific ethical issues in nurses’ ACP support for older patients undergoing maintenance hemodialysis. Furthermore, developing ethics training for nurses who are members of medical teams is challenging.

Conclusion

Decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis should not intervene after the patient loses decision-making ability, but at the stage when ACP discussions with the patient and family are still possible. For decision-making support by nursing professionals for older patients undergoing maintenance hemodialysis, strengthening education, such as ethics training to promote ethical behavior, and enhancing the ACP support system by nurses themselves and the healthcare team are some of the key challenges.

Competing Interests

The authors declare no competing interests relevant to this article.

Author's Contributions

All authors contributed to the conception and design of the study, data collection, data analysis, and interpretation of the results. All authors were involved in drafting and revising the manuscript and reviewed and approved the final version of the manuscript.

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