

# Development of a perspective structural model for self-care in patients on hemodialysis

著者	Ohashi Kayo, Inagaki Michiko, Tasaki Keiko, Horiguchi Tomomi, Asada Yuya
著者別表示	大橋 佳代, 稲垣 美智子, 多崎 恵子, 堀口 智美, 浅田 優也
journal or publication title	Journal of wellness and health care
volume	44
number	2
page range	23-34
year	2021-02-01
URL	<a href="http://doi.org/10.24517/00060407">http://doi.org/10.24517/00060407</a>

# Development of a perspective structural model for self-care in patients on hemodialysis

Kayo Ohashi, Michiko Inagaki<sup>1)</sup>, Keiko Tasaki<sup>1)</sup> \* Tomomi Horiguchi<sup>1)</sup>, Yuya Asada<sup>1)</sup>

## Abstract

**Purpose:** Hemodialysis patients create perspectives based on their current medical condition, ranging from acute exacerbation or terminal manifestation, and we believe that such perspectives may serve as the foundation of patient self-care. We developed a questionnaire to clarify the aspect of perspective in hemodialysis patients, and aimed to structuralize the relationship between their perspectives and self-care agency (SCAQ) and other associated factors.

**Method:** Based on the chronic illness trajectory framework, we developed a 25-item questionnaire regarding perspective for patients on hemodialysis, to identify factor structure through exploratory factor analysis. We also used structural equation modeling (SEM) to develop a structural model.

**Results:** We obtained a total of 104 valid responses. From the questionnaire, 17 out of 25 items were extracted to develop questions comprising a five-factor structure, with a 63.9 43% contribution ratio. The five factors included "perspective of uncontrollable sickness" as the first factor, followed by "perspective of getting one's own life back", "perspective of life going on as a hemodialysis patient", "perspective of maintaining socialization or pastimes", and "perspective of recovery from sickness".

The structural model consisted of eight items: four factors from the questionnaire, as well as physical symptoms, age, cohabitating individuals, and SCAQ. The measurement of fit had chi-squared value = 151.724 (P-value = 0.067), GFI = 0.865, AGFI = 0.819, CFI = 0.943, and RMSEA = 0.043, meeting the criteria as a model. Of the five factors, two ("perspective of getting one's own life back" and "perspective of life going on as a hemodialysis patient") showed significant effects on self-care agency. In addition, the factor "perspective of maintaining socialization or pastimes" was demonstrated to enhance those two factors.

**Discussion:** Our findings indicate a relationship between the structural model and the items extracted for effective perspective for self-care in patients on hemodialysis.

## KEY WORDS

Hemodialysis, Perspective, Self-care, Structural model

## Introduction

As of 2018, there were 339,841 patients on chronic dialysis in Japan, of which 59.6% were on hemodialysis.<sup>1)</sup> Since the number of kidney transplants in Japan is fewer than that of other countries, hemodialysis therapy is generally performed 3–4 times a week semi-

permanently as a life support measure to compensate for lost kidney function due to kidney failure.<sup>2)</sup>

Self-care is important in order for patients to maintain their hemodialysis therapy. Self-care was proposed by Orem as a way for patients to reconcile their own capabilities and development, through

Division of Health Sciences, Graduate School of Medical Sciences, Kanazawa University

1) Faculty of Health Sciences, Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University

\* Corresponding author

the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being. Additionally, self-care is a deliberate action, motivated by what he or she needs to do<sup>3)</sup>. It has been reported that, as it relates to patient intentions for how they want to be, having hope and improving their self-efficacy can improve their self-care agency<sup>4-8)</sup>. Self-efficacy is divided into outcome expectancy and effect expectancy<sup>9,10)</sup>; in a sense, it can be said to predict one's ability to handle self-management. On the other hand, most patients on hemodialysis have a sense of unease about their own future<sup>11,12)</sup>, which has been reported to have negative effects on self-management behavior<sup>5)</sup>. Because patients on hemodialysis undergo hemodialysis therapy as a life-prolonging treatment, it can be considered a manifestation of the terminal stage, but because hemodialysis therapy can extend into the long term, it also has characteristics of a chronic condition. Due to this, it is considered necessary to handle various changes. As a result, we believe that patients cannot simply hope to become a certain way, but rather have the perspective to rationally consider their future, from acute exacerbation to terminal manifestation, and that patients having this perspective serves as the foundation of self-care.

Two rationales to focus on the "perspective" skills of patients on hemodialysis are as follows. One is the theory and study reports utilized in patients with chronic conditions. The "chronic illness trajectory framework," proposed by Corbin and Strauss, is used in the care of patients with chronic diseases, including patients on hemodialysis; in "trajectory projections," one of the key concepts, they describe that having a perspective on the illness path allows us to forecast the possible outcomes, allowing us to take an appropriate course and manage them accordingly.<sup>13)</sup> Also, in the study exploring factors of self-care agency in patients with chronic diabetes on hemodialysis, Shimizu points out "perspective for the future" as one of the skills for self-fulfillment in people with diabetes.<sup>14)</sup>

The second rationale is the results from studies in the field of cancer nursing. Asai revealed that "having a realistic view of one's situation to foresee future life" is one of the motivational factors significantly correlated with self-care behaviors in cancer outpatients.<sup>15)</sup> We also found that patients with relapsed cancer experienced

difficulty in communicating with their families. Based on the results, we found that activities in which patients share many things with their family may be different, depending on their perspective for what would come.<sup>16)</sup> Because patients on hemodialysis are also considered a terminal manifestation of a chronic disease, they have some similarities with cancer patients.

However, study reports on the self-care of patients on hemodialysis to date focus mainly on difficulties in accepting hemodialysis treatment itself;<sup>17)</sup> few reports have described the aspects of self-care that patients themselves perform, and no reports have focused on "perspective." Katayama et al. reported that patients on hemodialysis had "stopped thinking about the future" in terms of a future time frame.<sup>12)</sup> Other reports also have described that physicians would tend to avoid discussing the future, including prognosis, with their hemodialysis patients, while hemodialysis patients would feel anxious about the uncertainty of their future, resulting in being poorly prepared for hemodialysis,<sup>18)</sup> suggesting insufficient support by healthcare providers to help patients on hemodialysis to have "perspective." Thus, identifying what would be necessary for patients on hemodialysis to have a sense of perspective was required.

The self-care required of patients on hemodialysis extends beyond concrete behaviors requiring a degree of technical knowledge, such as fluid and food intake, drug compliance, and shunt management; patients also need to maintain these behaviors as part of their lifestyle, and to cope with the various symptoms arising from hemodialysis therapy. Furthermore, many studies have shown the importance of family support for patients on hemodialysis,<sup>7,19)</sup> suggesting patients may also need to utilize reliable help from surrounding individuals. In this study, we have considered patient "perspective" to be the foundation of self-care; because of this, we believe that, rather than exploring its relationship to specific behaviors, it is necessary to explore its relationship to patients' self-care agency, such as the ability to maintain or to reconcile. Honjo's SCAQ, a scale used widely throughout Japan, was designed to measure this self-care agency<sup>20)</sup>.

Based on the above, in order to clarify the aspect of perspective of patients on hemodialysis through this study, we developed a questionnaire on "perspective,"

and aimed to structure the relationship between "perspective" and self-care agency (SCAQ) and other associated factors.

## Methods

Upon creating the structural model, a hypothetical model was first created to select factors and then to develop the questionnaire form. The structural model was then created through data collection and analysis. An overview of the methods used to create the hypothetical model, to select factors for developing the questionnaire, to collect data, and to analyze data is shown below.

### 1. Creation of the Hypothetical Model

Upon developing the hypothetical model, the "chronic illness trajectory framework" was considered as a foundation in this study. The "chronic illness trajectory framework" has a concept of chronic conditions as a multi-changing "path," and this "illness path" can be oriented if properly managed. Key concepts include trajectory phase transitions, trajectory forecasting, overall planning of the trajectory, conditions affecting management, management of the trajectory, impact on life cycle and daily activities, and their mutual influence. A "trajectory forecast" is a perspective on the illness path, in which the patient predicts the trajectory and thinks of ways to direct it independently. The "overall planning of the trajectory" is explained as a plan to direct the overall path of illness and to control existing symptoms, and that the plan should be personalized to each phase of the disease. The "management of the trajectory" is a process to direct the trajectory based on the overall planning of the trajectory.<sup>13)</sup>

This study is based on the researchers' belief that patients on hemodialysis would try to cope with various aspects arising in the course of their care by having the perspective to acquire self-care agency. Consequently, based on the "chronic illness trajectory framework," patients' perspective was postulated to affect their ability to demonstrate self-care agency. Physical symptoms were also assumed to have an impact on perspective, as patients develop their trajectory plans with the aim of controlling their current symptoms. Furthermore, since social support was considered one of the conditions influencing management of the trajectory,

social support was assumed relevant in the process of perspective to impact self-care agency<sup>13)</sup>. Based on the above, the hypothetical model was developed as shown in Figure 1.

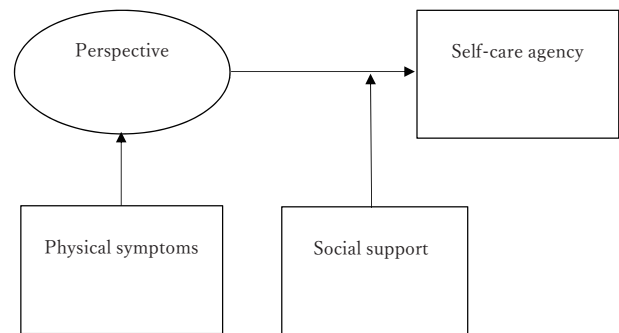


Figure1. Hypothetical model

### 2. Selection of Each Factor and Development of the Questionnaire Form

#### 1) Perspective

Because no literature or questions on the perspective of patients on hemodialysis were found, we developed our own questionnaire. When developing items for the questionnaire, we referred to the "trajectory phase" and "trajectory forecast," both the main concepts in the "chronic illness trajectory framework." The overall trajectory phases are categorized into three phases, i.e., upward trajectory (recovery phase), downward trajectory (deterioration and/or near-death phase), and controlled condition trajectory (stable phase). The trajectory forecast is a perspective on the illness path, including the significance of the disease, symptoms, life cycle, and time<sup>13)</sup>. Accordingly, based on these findings, a three-factor structure was adopted, consisting of the perspective at upward circumstances, the perspective at downward situations, and the perspective at maintained status, all examined as plausible parameters in view of possible symptoms and life cycles of patients on hemodialysis in each phase. For symptoms, not only the worsening of the condition itself, but weight management and shunt management, which are important for patients on hemodialysis, were also added to the items. As for life cycle, items such as enjoyment, hobbies, and socializing with others were added. Regarding the perspective at downward situations, the definition of theory included the near-death phase; our items were prepared after careful review from

an ethical point of view. To ensure face validity, four individuals with expertise in nursing research on patients on hemodialysis supervised the content of the review. In addition, five outpatients on hemodialysis were invited for pre-testing to help with checks and modifications. Table 1 shows the 25 items of the draft questionnaire.

2) Individual Factors

To obtain basic information about the patients, we collected data on their age, gender, hemodialysis history, hemodialysis time, frequency, and the primary disease leading to hemodialysis.

3) Physical Symptoms

For physical symptoms, we used the physical symptom scale for patients on hemodialysis by Kawabata et al. This scale asks how often seven different symptoms (nausea, headache, joint pain,

itching, numbness in the limbs, tiredness, and loss of appetite) have occurred within the last few weeks. “Always” is scored as 2 points, “sometimes” as 1 point, and “not at all” as 0 points<sup>7)</sup>.

4) Social Support

In terms of social support, we used the social support scale for chronic disease patients. This scale is often used in surveys on social support for patients with chronic illness, and consists of twelve items for daily emotional support and eight items for behavioral support for illness, for a total of 20 items, scored on a four-point scale from “does not apply at all” to “strongly applies”<sup>21)</sup>. In addition, the status and number of housemate(s), as well as the availability of a driver, were selected as factors, because hospital visits are very important for hemodialysis patients.

Table1. Original draft questionnaire on perspective of hemodialysis patients

Perspective at upward circumstances
1. Even if I have more things restricted in my life due to my illness, I will probably gradually return to my own life
2. Though I'm not feeling well, I think I'll recover
3. Even if I have to be hospitalized, I will receive care and will recover
4. Even if shunt troubles occur, I can continue hemodialysis again
5. Though I may be not able to manage my weight satisfactorily, I hope I can come through
6. Even if complications may develop to make me feel unwell, I will probably recover gradually
7. Though emotionally hard, I think I can recover from such pain
8. Though I now have to stop doing hobbies or what I enjoy due to my illness, I hope I can enjoy them again
9. Though my illness reduces my social interactions, I hope I can get them back again
Perspective at downward situations
10. One day it may become difficult to take care of my health and to continue my current lifestyle
11. Though I try to control my body weight, I may fail to manage it properly at certain instances
12. Even if I take care of living with a shunt, I may have trouble with it
13. I could experience serious and unrelievable discomfort
14. Hospital visits for hemodialysis treatment could be difficult during certain periods of time
15. One day I may suddenly become unwell and have to be hospitalized for treatment.
16. Though not a sudden change, my health may deteriorate and gradually make me weak
17. One day I may realize the weakening of my body, which requires changes to my current lifestyle
18. When my condition deteriorates, I may have to give up my enjoyment or hobbies for a while
19. My conditions could deteriorate too much to socialize
Perspective at maintained status
20. My disease sounds like it will stay the same, no improvement or no progression
21. I'll probably continue hemodialysis treatment with my own self-management in the future
22. Though my health may not recover completely, I think I can manage it anyway not to get worse
23. I think I will continue to live my current life within the limits of my illness
24. I think I can continue to enjoy activities or hobbies within the limits of my illness
25. I can continue to socialize with the people I interact with, within the limits of my illness

### 5) Self-Care Agency

In this study, we adopted Honjo's SCAQ,<sup>20)</sup> based on the assumption that patients on hemodialysis may not only take specific self-management behaviors, but also demonstrate certain skills to obtain support from others or to continue their own management in individual ways when they foresee their future and deal with it. This scale is composed of four subscales: a) ability to perform self-care operations, b) ability to adjust one's own physical condition based on personal weaknesses, c) ability to concentrate one's attention on self-care, and d) ability to receive valid support, and "acquisition of effective support", and covers a total of 29 items, scored on a 5-point scale<sup>20)</sup>.

## 3. Data Collection

### 1) Study Subjects

The subjects included in the study were outpatients on hemodialysis. Patients were excluded from the study if they had major complications that could potentially significantly impact their physical or mental health (such as severe heart failure or blindness), if they had cognitive impairments that would make it difficult to respond to questionnaires or to communicate, or if they were minors.

### 2) Survey Sites

The survey was conducted at five hospitals with hemodialysis units in Ishikawa prefecture. These five institutions are the core hospitals in their regions, with bed capacities of beds ranging from 125 to 499.

### 3) Subject Selection and Collection of Questionnaires

Subject selection was performed based on convenience sampling. We explained the study to the head nurse in the hemodialysis unit at each hospital, and requested the selection of patients for the study. After receiving a referral from the head nurse, we explained the study to patients in person or in writing, distributed the questionnaire, and collected the form, which was regarded as consent to participate in the study. The survey was conducted interview-style using the questionnaire. The form was collected on the spot, or collected later from a deposit location if patients filled out the questionnaire themselves. Interviews were conducted during dialysis. For these, we received patients' approval to conduct the interview surveys in an open space, and explained that if they felt unwell

during the interview, we would end it immediately, and gained patients' consent.

### 4) Analytical Procedure

Data analysis was conducted in two stages. First, an exploratory factor analysis was performed to evaluate our items in the questionnaire on hemodialysis perspective.

Then, the structural model was created by performing structural equation modeling (SEM). For the analyses, we used the statistical software SPSS Statistics 25.0 and Amos 26.0.

### 5) Ethical Considerations

Before obtaining consent from subjects, details were explained using a written request form, including the purpose and methods of the study, that there would be no impact on their treatment based on their participation or non-participation, how data would be handled, and data destruction upon study completion.

The study was conducted after receiving approval from the Research Ethics Committee at the Graduate School of Medical Sciences, Kanazawa University. (approval no.908-1)

## Results

### 1. Demographic Characteristics

Interviews were conducted upon obtaining referrals from survey sites. At one hospital, the interview-style survey was not approved, so we distributed questionnaires and later collected them via a deposit location. All 94 copies of the interview questionnaire were collected at the interviews. For hospitals using deposit collection, 30 copies of the questionnaire were distributed, and 15 copies were collected. We obtained a total of 104 valid responses (valid response rate 95.4%). Responses were excluded for analysis if many answers remained blank, if the interview subject was found to likely have a functional cognitive disorder, or if the patient was hospitalized during the period of study.

The mean age of the patients was  $66.1 \pm 11.0$  years, with 70 males (67.3%) and 34 females (32.7%). The most common primary disease leading to hemodialysis was diabetic nephropathy, followed by glomerulonephritis and pyelonephritis. Table 2 shows details and other demographics.

Table2. Patient characteristics

		n=104	
		mean ± SD(years)	
Age		66.1 ± 11.0	
		number	%
Gender	Male	70	67.3
	Female	34	32.7
Housemate	with	85	81.7
	without	19	18.3
Driver	with	50	48.1
	without	54	51.9
		mean ± SD(years)	
Dialysis History		8.7 ± 8.5	
		mean ± SD(times/week)	
Frequency of Dialysis		3.0 ± 0.2	
		mean ± SD(hours/times)	
Dialysis time		3.8 ± 0.5	
		number	%
Primary disease leading to hemodialysis	Diabetic nephropathy	41	39.4
	Glomerulonephritis	17	16.3
	Pyelonephritis	7	6.7
	Polycystic kidney disease	4	3.8
	High blood pressure	2	1.9
	IgA nephropathy	2	1.9
	Renal sclerosis	1	1.0
	Other	14	13.5
	unknown	16	15.4

## 2. Exploratory Factor Analysis in Items Related to the Perspective of Patients on Hemodialysis

Before conducting the exploratory factor analysis, we checked for any ceiling/floor effects as well as IT correlations in order to ensure the appropriateness and consistency/coherence of the questionnaire items. There were no ceiling/floor effects in the 25 items of the draft questionnaire. We also deleted 8 items with applicable to correlation coefficients of  $\leq 0.25$  based on IT correlation. For IT correlations, the correlation coefficient  $\leq 0.3$  is commonly used as the standard. In this study, however, we set  $\leq 0.25$  as the standard because some potentially important perspective items were included in items applicable to the correlation coefficient  $\leq 0.3$ .

After confirming the appropriateness and consistency/coherence of items, an exploratory factor analysis was conducted on the remaining 17 items, using the maximum likelihood method and promax rotation. Using an eigenvalue of 1 or greater as a standard, five factors were extracted. Factor loading for each factor

of the 17 items was  $\geq 0.35$ . Question 6 was included into the fifth factor, showing the highest factor loading, though it also had  $\geq 0.3$  of the factor loadings for the third and fourth factors as well, considering the nature of the question. The cumulative contribution rate was 63.943%, with Cronbach's alpha coefficients of 0.731, 0.724, 0.731, 0.720, and 0.668 for the first, second, third, fourth, and fifth factors, respectively; the Cronbach's alpha coefficient for the overall scale was 0.709. The sample appropriateness of KMO was 0.742, and Bartlett's test of sphericity had a significance probability of  $p < 0.01$ . The nomenclature of the factors is shown below.

The first factor was named "perspective of uncontrollable sickness," because it consisted of items to predict sickness. The second factor was named "perspective of getting one's own life back," because it consisted of items showing patients' thoughts about their willingness to live like themselves even though their disease had forced them to stop their hobbies and/or social activities, or brought various restrictions.



Table3. Exploratory factor analysis in items related to the perspective of patients on hemodialysis

Item content	Factor				
	1	2	3	4	5
1. perspective of uncontrollable sickness					
⑤One day I may suddenly become unwell and have to be hospitalized for treatment	0.900	-0.021	0.122	0.130	-0.082
⑦One day I may realize the weakening of my body, which requires changes to my current lifestyle	0.741	-0.062	0.071	0.008	0.026
③I could experience serious and unrelievable discomfort	0.529	0.041	0.020	-0.057	-0.099
①Though I try to control my body weight, I may fail to manage it properly at certain instances	0.513	0.083	-0.331	0.039	0.202
2. perspective of getting one's own life back					
⑧Though I now have to stop doing hobbies or what I enjoy due to my illness, I hope I can enjoy them again	-0.034	0.845	-0.037	0.067	-0.156
⑨Though my illness reduces my social interactions, I hope I can get them back again	0.024	0.637	0.020	0.070	0.149
①Even if I have more things restricted in my life due to my illness, I will probably gradually return to my own life	0.075	0.577	0.217	-0.167	0.099
⑦Though emotionally hard, I think I can recover from such pain	-0.085	0.364	0.089	0.078	0.004
3. perspective of life going on as a hemodialysis patient					
②I'll probably continue hemodialysis treatment with my own self-management in the future	0.107	0.087	0.657	-0.139	0.005
②Though my health may not recover completely, I think I can manage it anyway not to get worse	-0.168	0.075	0.575	0.086	0.085
⑤Though I may be not able to manage my weight satisfactorily, I hope I can come through	0.114	0.076	0.566	0.059	0.029
③I think I will continue to live my current life within the limits of my illness	-0.147	-0.100	0.501	0.353	0.040
4. perspective of maintaining socialization or pastimes					
⑤I can continue to socialize with the people I interact with, within the limits of my illness	0.137	-0.118	0.086	0.906	0.034
④ I think I can continue to enjoy activities or hobbies within the limits of my illness	-0.029	0.249	-0.037	0.645	-0.128
5. perspective of recovery from sickness					
③ Even if I have to be hospitalized, I will receive care and will recover	-0.030	-0.032	0.043	-0.076	0.733
②Though I'm not feeling well, I think I'll recover	0.023	0.025	0.151	-0.024	0.717
⑥ Even if complications may develop to make me feel unwell, I will probably recover gradually	-0.118	0.074	-0.321	0.326	0.354
eigenvalue	4.634	2.265	1.695	1.237	1.039
contribution rate	27.258	13.326	9.969	7.278	6.111
cumulative contribution rate	27.258	40.584	50.553	57.832	63.943
Factor correlations	1	-0.068	-0.317	-0.365	-0.250
	2		0.177	0.385	0.499
	3			0.467	0.264
	4				0.543
Cronbach's alpha coefficients	Total	0.709			
the maximum likelihood method and promax rotation					
KMO=0.742 Bartlett's test of sphericity p<0.01					

The third factor was named "perspective of life going on as a hemodialysis patient," because it consisted of items to foresee the continuation of important management to maintain one's life as a hemodialysis patient, such as management of physical condition and weight, as well as the continuation of their current life. The fourth factor was named "perspective of maintaining socialization or pastimes," and consisted of two items: anticipating unchanged socialization with the people they currently socialize with, and continuation of enjoyment and hobbies, both within the limits of the disease. The fifth factor was named "perspective of recovery from sickness," and consisted of items

regarding foreseeing their recovery from hospitalization, sickness, or complications if they happened. (Table 3)

### 3. Structural Model Leading to Self-care of Patients on Hemodialysis

Based on the hypothetical model, we created the structural model with self-care agency (SCAQ) as a consequence. Based on the Wald test, we modified the model from the path with smaller test estimators, deleted items, and examined the model to explore a more explanatory structural model. The results provided the structural model shown in Figure 2. The measurements of fit in this structural model were: chi-



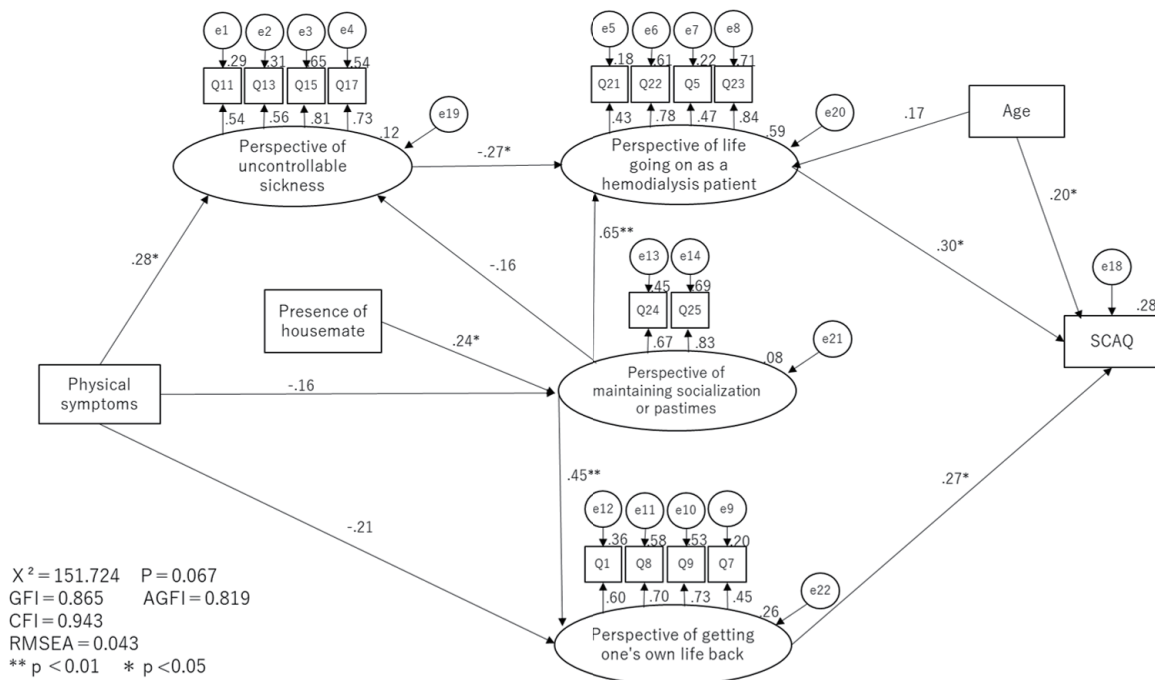


Figure 2. Perspective structural model for self-care in patients on hemodialysis

squared value = 151.724 ( $P = 0.067$ ),  $GFI = 0.865$ ,  $AGFI = 0.819$ ,  $CFI = 0.943$ , and  $RMSEA = 0.043$ . Though  $GFI$  and  $AGFI$  were not fully sufficient, they still showed high measurement of fit, and statistical levels were met in  $CFI$  and  $RMSEA$ . Therefore, the model was determined reasonable.

The factors of "perspective of getting one's own life back" and "perspective of life going on as a hemodialysis patient" showed significant effects on self-care agency. Additionally, "perspective of uncontrollable sickness" affected by physical symptoms showed a negative impact on "perspective of life going on as a hemodialysis patient," indirectly reducing self-care agency. On the other hand, "perspective of maintaining socialization or pastimes" had a significant beneficial effect on "perspective of getting one's own life back" and "perspective of life going on as a hemodialysis patient." Although not significant, it also had a negative effect on "perspective of uncontrollable sickness," indicating that helping hemodialysis patients to have a positive perspective indirectly acts to improve their self-care agency. (Figure 2)

### Discussion

#### 1. Questionnaire Items for the Perspective of patients on Hemodialysis

In this study, we focused on a new element, the perspective of patients on chronic hemodialysis for medical care, and thus developed our own questionnaire. Consequently, 17 out of 25 items were adopted to develop a questionnaire consisting of a five-factor structure, with an overall Cronbach's alpha coefficient of 0.709, indicating an internally consistent factor structure.

The first factor was "perspective of uncontrollable sickness." Previous studies have often reported that patients on hemodialysis feel anxious about the uncertainty of future<sup>11,12)</sup>, such as the possible length of hemodialysis treatment or the onset of complications. Hence, this perspective was considered appropriate as the first factor in our study.

The second to fifth factors were "perspective of getting one's own life back," "perspective of life going on as a hemodialysis patient," "perspective of maintaining socialization or pastimes," and "perspective of recovery from sickness." These items were drafted from the illness trajectory in this study, likely supporting our hypothesis that patients on hemodialysis may have not only a downward perspective, but also a perspective for recovery from sickness or for stable lives.

Next, let us discuss the differences between the three-factor structure, with the 25 items developed

as the original draft for this study, and the factor structure actually obtained from the study outcome. In the original draft, we developed items based on the assumption of three perspectives; the perspective at upward circumstances, the perspective at downward situations, and the perspective at maintained status. However, after performing the factor analysis, four of the original ten items were extracted to form a single factor for the perspective at downward situations, while both "perspective at upward circumstances" and "perspective at maintained status" were divided into two to rename new factors. "Perspective at upward circumstances" was divided into four items for "perspective of getting one's own life back" and three items for "perspective of recovery from sickness." Likewise, "perspective at maintained status" was divided into four items for "perspective of life going on as a dialysis patient" and two items for "perspective of maintaining socialization or pastimes." This was recognized to identify the diverse and specific perspective of patients as a factor structure.

Nakazawa and Ishii, et al. reported on the process of establishing a life for patients on hemodialysis<sup>22,23</sup>. Nakazawa reported that patients on hemodialysis would reduce their enjoyment or worthwhile activities due to their medical care, but may find a new kind of enjoyment.<sup>22</sup> Similarly, Ishii et al. reported the process of experiences that patients on long-term hemodialysis go through: "the agony of the decision" to undergo hemodialysis treatment, then to "cope with the new situation," and finally arriving at "establishment of a lifestyle with hemodialysis."<sup>23</sup> Although both reports are retrospective results of a process leading up to the present, our study brings a unique outcome, showing that patients themselves can foresee not only the recovery of their physical condition or the continuation of self-management behaviors necessary to maintain the hemodialysis treatment, but can also take their own life back, and keep socializing with others and enjoying pastimes in the future.

## 2. The Perspective Structural Model Leading to Self-care of Patients on Hemodialysis

In our study, we focused on the new concept of the perspective of patients on hemodialysis, and developed a structural model showing the impact of perspective on

self-care agency. This may help us to find new points of view in supporting patients to improve their self-care skills.

Similar to self-care is self-management. Self-management means "patients know and learn enough about their health and illness, consult with medical staff and family members, make their own decisions and, carry them out and take responsibility for them"<sup>24</sup>. Our results indicate that patients have perspective on their future, and perform necessary self-care based on this perspective; one might say that these results could propose the new concept of perspective as a specific ability related to self-management. In addition, it is said that self-efficacy is the key to self-management support<sup>24</sup>, but the factor of "perspective of life going on as a hemodialysis patient" in this study result is similar to self-efficacy. Consequently, it can be supported that the results of this study can be utilized in patient self-management support.

As for the structure of the model, the way it affects self-care is the main focus of our discussion.

The two perspective factors found in the model to have a direct and significant positive effect on self-care were "perspective of getting one's own life back" and "perspective of life going on as a hemodialysis patient." Honjo's SCAQ, used in our study for items to indicate self-care agency, is composed of four subscales: a) ability to perform self-care operations, b) ability to adjust one's own physical condition based on personal weaknesses, c) ability to concentrate one's attention on self-care, and d) ability to receive valid support.<sup>20</sup> Thus, we suggested that having these two perspectives could help patients to acquire this self-care agency. Since no reports have found this "perspective" associated with improving self-care, our study provides a new finding. In addition, self-care agency was directly and positively affected by age, an individual factor. Age was positively correlated with self-management behaviors. The higher the age, the higher self-management behavior scores, as reported by previous studies.<sup>25</sup>

Two factors, namely "perspective of getting one's own life back" and "perspective of life going on as a hemodialysis patient," were significantly and highly positively affected, with a causal relationship with "perspective of maintaining socialization or pastimes." In other words, the latter factor was considered highly

important because the structure suggested the possibility of increasing self-care agency indirectly, based on an increase in this factor. Furthermore, this factor was significantly positively affected by living together with someone, indicating that close family might be a supportive presence for this perspective. Accordingly, our results recommended medical practitioners place importance on the points of view of the patient's family relationships, social interactions/activities, and pleasure in their lives.

Meanwhile, "physical symptoms" were also important as a causal factor, regarded as the origin of the structural model. In addition, each of the perspective factors was influenced by physical symptoms, suggesting the possible interpretation that patients may foresee their medical condition and future life based on their physical symptoms. In particular, "perspective of uncontrollable sickness" was significantly and positively affected by physical symptoms. Moreover, they also showed a negative and significant impact on the factor "perspective of life going on as a hemodialysis patient," which is directly associated with improving self-care, thus indirectly decreasing self-care agency. Sickness triggers anxiety, and previous studies have also reported that anxiety decreases self-care agency<sup>5)</sup>. Therefore, self-care agency would likely be enhanced by reducing patients' anxiety through understanding and alleviation of physical symptoms. In addition, education of patients by healthcare professionals is important, including the appropriate knowledge of complications and sickness, management to prevent them, and suggested actions for

illness.

### Limitations and Directions for Future Research

This study was a survey conducted within one prefecture; we believe that there are limits to its generalizability. In addition, we cannot deny that the survey method may have had some influence on the results, due to the mixture of interview survey and deferred survey methods depending on the wishes of the facilities surveyed, and the difference in response rates. In the future, we believe that further examination will be necessary, with an increased number of patients surveyed, and with surveys conducted in a consistent, unified manner.

### Conclusions

We developed a questionnaire on the perspectives of patients on hemodialysis, and drew a structural model of perspectives leading to self-care agency. Our results indicated that self-care agency was directly enhanced by the factors "perspective of getting one's own life back" and "perspective of life going on as a hemodialysis patient," and indirectly by the factor "perspective of maintaining socialization or pastimes." In addition, "perspective of uncontrollable sickness" indirectly reduced self-care agency. The presence of physical symptoms was attributed to the patient's perspective, clarifying the importance of alleviating physical symptoms.

### References

- 1) The Japanese Society for Dialysis Therapy : An Overview of Regular Dialysis Treatment in Japan, (<https://docs.jsdt.or.jp/overview/file/2018/pdf/01.pdf>), 2020.8.25 (in Japanese)
- 2) Ishikawa I(2004): Recent statistics of renal transplantation: treatment of end stage renal disease - comparison between the western world and Japan, *The Japanese Journal of Nephrology*, 46(1), 12-19. (in Japanese)
- 3) Dorothea E. Orem(2001)/Onodera T(2005): *Nursing; Concepts of Practice* (4), 40-45, Igaku-shoin, Tokyo. (in Japanese)
- 4) Cha, Jieun(2017): Structural Equation Modeling of Self-Management in Patients with Hemodialysis, *J Korean Acad Nurs*, 47(1), 14-24.
- 5) Hui Li, Ya-fang Jiang, Chiu-Chu Lin (2014): Factors associated with self-management by people undergoing hemodialysis: a descriptive study, *Int J Nurs Stud*, 51(2), 208-216.
- 6) Takagishi H(2008): Characteristics of Factors Influencing Self-Management of Hemodialysis Patients and Correlations among the Factors -Focus on Self-Efficacy, Social-Support, and Eating Behavior-, *Bulletin of Faculty of Nursing, Yamanashi Prefectural University*, 10, 13-26. (in Japanese)
- 7) Kawabata K, Ishida Y, Oka M(1998): Factors Influencing Management Behavior and Self-efficacy in Hemodialysis Patients, *Japanese Journal of Physiological Anthropology*, 3(3), 89-96. (in

- Japanese)
- 8) Shu-Fang Vivienne Wu, Nan-Chen Hsieh, Li-Ju Lin, et al.(2016): Prediction of self-care behaviour on the basis of knowledge about chronic kidney disease using self-efficacy as a mediator, *J Clin Nurs*, 25(17-18), 2609- 2618.
  - 9) Bandura A.(1997): *Self-efficacy; The exercise of control*, W.H. Freeman, New York.
  - 10) Emoto R(2000): Concept Analysis of “Self-Efficacy”, *Journal of Japan Academy of Nursing Science*, 20(2), 39-45. (in Japanese)
  - 11) Hara A, Hayashi Y(2004): Stressors and Coping in Hemodialysis Patients, *Bulletin of Faculty of Health Sciences, Okayama University Medical School*, 15, 15-21. (in Japanese)
  - 12) Katayama F, Kodama M, Osada H(2008): Examination of Illness Cognition in Hemodialysis Patients by Narrative Interpretation: Based on the Self-regulatory Model of Illness Behavior, *Journal of Human Care Studies* ,9, 4-17. (in Japanese)
  - 13) Pierre Woog(1992)/Kuroe Y, Ichihashi K, Takarada M(1995): The chronic illness trajectory framework-The Corbin and Strauss Nursing Model-(1), 1-31, Igaku-Shoin, Tokyo. (in Japanese)
  - 14) Shimizu Y, Kuroda K, Uchiumi K, et al.(2005): Extraction of Self-Care Agency Elements for Patients with Diabetes-Toward Development of Nursing Effect Measurement Tools-, *Journal of Chiba Academy of Nursing Science*, 11(2), 23-30. (in Japanese)
  - 15) Asai K, Iga M, Emukai M, et al.(2009): Self-care behaviors and related factors in cancer patients receiving outpatient chemotherapy, *Nihon Kango Gakkai rombunshuu. Seijin kango*2, 39, 182-184 (in Japanese)
  - 16) Ohashi K, Inagaki M, Tasaki K, et al.(2020): Qualitative Analysis of Cancer Patient Dialogue with Their Families Using a Phenomenological Approach, *Journal of Japanese Society of Nursing Research*, 43, (4), 705-713. (in Japanese)
  - 17) Tagami I, Watarai N(2011): An Analysis of research on Psychological Characteristics of Patients with Hemodialysis Treatment, *Medical and Health Science Research*, 2, 175-183. (in Japanese)
  - 18) Jane O Schell, Uptal D Patel, Karen E Steinhauser, et. al.(2012): Discussions of the kidney disease trajectory by elderly patients and nephrologists: a qualitative study, *Am J Kidney Dis*, 59(4), 495-503.
  - 19) Okada T, Hori Y, Mikouchi N, et al.(2011): Relation Between Concrete Contents of Supports from Family and Self-management Behaviors with Diet and Fluid Restrictions in Patients Receiving Hemodialysis, *Journal of Japan Society of Nursing and Health Care*,13(1), 21-30. (in Japanese)
  - 20) Honjo K(2001): Revision of the Self-Care Agency Questionnaire for Patients with Chronic Illness, *Journal of Japan Academy of Nursing Science*, 21(1), 29-39. (in Japanese)
  - 21) Kim W.S, Shimada H, Sakano Y(1998): Effects of Social Support and Self-efficacy on Psychological Stress Responses in Chronic Disease Patients, *Japanese Journal of Psychosomatic Medicine*, 38(5), 317-323. (in Japanese)
  - 22) Nakazawa T(2004): Assessment of “Life Restructuring” of Patients on Dialysis, Focus on Over-middle-aged Patients with Diabetic Nephropathy Who are Going to Initiate Dialysis, *Journal of Japan Academy of Nursing Science*, 24(2), 33-41. (in Japanese)
  - 23) Ishii S, Tomita E, Obinata K, et al.(2014): Process of the experience in the patients who maintain hemodialysis treatment more than 15 years, and continue, *Medical journal of Nagano Red Cross Hospital*, 28, 72-78. (in Japanese)
  - 24) Yasukata F(2017): Study through Coursework and Seminars on Health Behavioral Science, *Japan Academy for Health Behavioral Science. Lecture series. Various approaches to self-management support*, *Journal of the Japan Academy for Health Behavioral Science*, 31, 74-75. (in Japanese)
  - 25) Matsumoto T, Koga A, Kumagai Y(2018): Effects of Self-Esteem on the Self-Care Behavior of Chronic Dialysis Patients, *Journal of Japanese Society of Nursing Research*, 41(1), 29-35. (in Japanese)

## 血液透析患者のセルフケアにつながる見通し構造モデルの作成

大橋 佳代, 稲垣 美智子<sup>1)</sup>, 多崎 恵子<sup>1)\*</sup>, 堀口 智美<sup>1)</sup>, 浅田 優也<sup>1)</sup>

### 要 旨

**目的：**血液透析患者は現在の病状から、急性増悪から終末像まで今後の自分について見通しを持っており、そうした見通す力が患者のセルフケアの基盤となるのではないかと考えた。本研究では血液透析患者の見通し力の質問紙を作成すると共に、見通し力とセルフケア能力 (SCAQ) 及び、その他の因子との関連を構造化することを目的とした。

**方法：**慢性疾患の病みの軌跡理論を基盤に、“見通し”に関する 25 項目からなる質問紙原案を作成し、血液透析患者を対象に調査を行い、探索的因子分析にて因子構造を明らかとした。また、構造方程式モデリング (SEM) を用い、構造モデルの作成を行った。

**結果：**有効回答数は 104 であった。質問項目は 17 項目が抽出され、寄与率 63.943%である 5 因子構造の質問項目が作成できた。5 因子は“制御できない不調の見通し”を第 1 因子として“自分らしい生活を取り戻す見通し”“透析患者としての生活が続く見通し”“人付き合いや楽しみを続けていく見通し”“不調からの回復の見通し”であった。

また構造モデルは、質問紙からの 4 つの因子と身体症状、年齢、同居者の有無、SCAQ の 8 つからなり、適合度指標が $\chi^2$ 値 = 151.724 (P 値 = 0.067), GFI = 0.865, AGFI = 0.819, CFI = 0.943, RMSEA = 0.043 であり、モデルとしての基準を満たした。5 因子のうち、“自分らしい生活を取り戻す見通し”と“透析患者としての生活が続く見通し”の 2 因子が、直接有意にセルフケア能力に正の作用を示した。また、“人付き合いや楽しみを続けていく見通し”は、この 2 因子を高めることが示された。

**考察：**本結果は、血液透析患者のセルフケアに有効な“見通し”の具体的な項目抽出と、その構造モデルにより関係を示すことができた。