

Dialysis Staff Encouragement and Fluid Control Adherence in Patients On Hemodialysis



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Fluid control in patients on dialysis is an important determinant of outcome. A large change in weight during a dialysis session is related to lower effectiveness of dialysis (Sharp, Wild, & Gumley, 2005), exacerbation of hypertension (Inrig et al., 2007; López-Gómez, Villaverde, Jofre, Rodriguez-Benitez, & Pérez-García, 2005; Rahman, Fu, Sehgal, & Smith, 2000; Sherman, Daniel, & Cody, 1993), pulmonary edema (Abuelo, 1998), and a higher risk for death (Leggat, 2005; Saran et al., 2003). Nevertheless, fluid control is one of the more difficult restrictions affecting adherence (Newmann & Litchfield, 2005), with findings showing prevalences of nonadherence in patients on hemodialysis of 10% to 60%, depending on the definition of fluid control adherence (Denhaerynck et al., 2007).

While previous studies of this issue have explored associations with nonmodifiable demographic characteristics, such as sex (Cummings, Becker, Kirscht, & Levin, 1982), age (Bame, Petersen, & Wray, 1993), educational status (Morduchowicz et al., 1993), and income (Bame et al., 1993), more recent efforts have focused on the modifiable variables of psychosocial factors; in particular,

Background: Fluid control in patients on dialysis is an important predictor of outcome but is a difficult restriction to achieve. The authors examined the association between dialysis staff encouragement and fluid control adherence in patients on hemodialysis.

Methods: This cross-sectional study used the dialysis staff encouragement subscale (DSE). The outcome measure was intradialytic weight loss (IWL) of dry weight (DW), with nonadherence defined as IWL/DW greater than 5.7%. Predictors of nonadherence were identified using logistic regression. Odds ratio (OR) was for the occurrence of nonadherence as it correlated with a one standard deviation (SD) decrease in scale score.

Results: Seventy-two patients on hemodialysis participated, 45 men (62.5%) and 27 women. The crude OR in DSE score was 1.75 (95% confidence interval [CI]: 1.02 to 3.0) and adjusted odds ratio was 2.51 (95% CI: 0.99 to 6.34).

Conclusion: Dialysis staff encouragement is important in improving fluid control adherence.

Goal

To provide an overview of the importance of dialysis staff encouragement and fluid control adherence in patients on hemodialysis.

Objectives

1. Describe the relationship between patients' perceptions of dialysis staff encouragement and fluid control adherence as outlined in this study.
2. Discuss the components of the health belief model and fluid control adherence.

much attention is now focused on social support as an important psychosocial factor related to fluid control adherence in patients on dialysis (Heaney & Israel, 2002). Social support is defined as support by social and interactional activities (Cassel, 1976; Heaney & Israel, 2002; House, Landis, & Umberson, 1988) from sources such as family, friends, colleagues, and medical staff (Kovac,

Patel, Peterson, & Kimmel, 2002).

The patient's perception of family support is associated with not only lower levels of interdialytic weight gain, but also survival (Kara, Caglar, & Kilic, 2007; Patel, Peterson, & Kimmel, 2005; Thong, Kaptein, Krediet, Boeschoten, & Dekker, 2007). Although the regularity and extended duration of each treatment episode provides patients on dialysis a greater

Authors' biographic statements appear on page 290.

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chance of receiving support from dialysis staff than those with other chronic diseases, few studies have clarified the relationship between staff support and fluid control adherence in these patients (Kovac et al., 2002). Further, the degree to which dialysis staff support is associated with fluid control adherence compared with that of other psychosocial components of the Health Belief Model (HBM) is also unknown, notwithstanding the HBM's status as one of the most widely used conceptual frameworks in health behavior (Janz, Champion, & Strecher, 2002).

The authors investigated the relationship between patients' perceptions of dialysis staff encouragement (Kidney Disease Quality of Life subscale instrument – KDQOL) and fluid control adherence. They also examined the relationship between the psychosocial factors of the HBM and fluid control adherence in comparison with that of dialysis staff encouragement.

Subjects and Methods

Study Design and Subjects

The study was conducted under a cross-sectional design from January 2007 to April 2007 in 72 participants from a public hospital (52 patients) and a dialysis clinic (20 patients) in a single district in northeast Honshu, Japan. Inclusion was restricted to outpatients 20 years of age or older

undergoing hemodialysis (HD) treatment for end stage renal disease (ESRD) for at least six months before entry.

Background Data

Demographic characteristics, including gender, age, education, marital status, living situation, job, and income, were collected using a self-reported questionnaire. Information on the primary cause of kidney failure, diabetes, diuretic use, duration of dialysis, frequency of dialysis per week, and body mass index (BMI) was obtained from the dialysis staff. Laboratory values for serum hematocrit, albumin, normalized protein catabolic rate (nPCR), potassium, phosphate, and Kt/V were collected from January 2007 to April 2007. Average values were calculated from 11 samples for mean serum hematocrit, 3 to 6 for albumin (depending on the hospital), 3 for nPCR, 14 for potassium, and 11 for phosphate.

Assessment of Fluid Control Adherence

The outcome measure was intradialytic weight loss (IWL) to dry weight (DW), defined as the amount of weight lost during an HD session. Mean IWL from January 24, 2007, to April 10, 2007, was used, while mean dry weight was from January 2007 to March 2007. In accordance with the cutoff defined by Leggat et al. (1998), nonadherence was defined as an

IWG of more than 5.7% of dry weight (Hecking et al., 2004; Leggat et al., 1998).

Dialysis Staff Support

Dialysis staff support was measured using the dialysis staff encouragement subscale (DSE) of the KDQOL-SF™ (Green et al., 2001). Development and validation of the KDQOL-SF have been described elsewhere (Green et al., 2001).

The DSE contains two statements: (1) the dialysis staff encouraged me to be as independent as possible, and (2) the dialysis staff supported me in coping with my kidney disease. For each statement, subjects were asked to choose one of the following responses: definitely true (1 point), mostly true (2 points), don't know (3 points), mostly false (4 points), and definitely false (5 points). The score was computed by summing the scores from each question item and then transforming the raw scores into a 0 to 100-point scale (Green et al., 2001), with a higher score reflecting greater staff encouragement.

Self-Efficacy

Dietary self-efficacy was measured using the dietary management self-efficacy scale (DMSES), a 9-item scale whose development and validation have been described elsewhere (Oka & Chaboyer, 2001; Oka, Tomura, Munakata, & Tsuchiya, 1996). The DMSES contains the following two series of statements.

I have confidence in my ability to manage my diet:

- When irritated.
- When I eat out.
- When hungry.
- When dining out or at a party.
- When feeling unpleasant.
- When I feel a constant need to have something in my mouth.
- In a reasonable way.

I have confidence in my ability to avoid a favorite food which caused a bad result on my blood test:

- Even when it is in front of me, or
- When it is suggested that I eat it.

For each statement, the subjects were asked to choose one of the following responses: definitely true (4 points), mostly true (3 points), mostly false (2 points), and definitely false (1 point). Items from each of these domains were scored as Likert scales. Item responses were summed to provide a scale score that ranged from 0 to 36, with a higher score reflecting greater self-efficacy.

Health Locus of Control

Internal health locus of control was measured using the Japanese version of the internal health locus of control subscale (IHLC) of the Health Locus of Control Scale, a 5-item scale whose development and validation have been described elsewhere (Horige, 1991).

The IHLC contains the following statements:

- The main thing which affects my health is what I myself do.
- My physical well being depends on how well I take care of myself.
- If I become sick, I have the power to make myself well again.
- I take care of myself to stay healthy.
- If I become sick, whether I become well or not, depends on myself.

For each statement, the subjects were asked to choose one of the following responses: strongly agree (6 point), moderately agree (5 points), slightly agree (3 points), moderately disagree (2 points), and strongly disagree (1 point). Items from each of

these domains were scored as Likert scales. Item responses were summed to provide a scale score that ranged from 0 to 30, with a higher score reflecting a higher locus of control.

Psychological Burden

Psychological burden was measured using the mental health subscale (MH) of the Short-Form Health Survey (SF-36), a 5-item scale whose development and validation have been described elsewhere (Fukuhara, Bito, Green, Hsiao, & Kurokawa, 1998). The MH contains the following questions: How much of the time during the last month have you:

- Been a very nervous person?
- Felt downhearted and blue?
- Felt calm and peaceful?
- Felt so down in the dumps that nothing could cheer you up?
- Been a happy person?

For each question, the subjects were asked to choose one of the following responses: all of the time (1 point), most of the time (2 points), a good bit of the time (3 points), some of the time (4 points), a little of the time (5 points), or none of the time (6 points). Because some items ask about positive feelings, their scoring was reversed. Items from each of these domains were scored as Likert scales. Item responses were summed to provide a scale score that ranged from 0 to 100, with a higher score reflecting better mental health.

Diet Therapy Burden

Diet therapy burden was measured using the Burden of Diet therapy subscale (BD) of the Diet-Related Quality of Life (DQOL) survey, a 6-item scale whose development and validation have been described elsewhere (Sato, Suzukamo, Miyashita, & Kazuma, 2004; Suzukamo, Fukuhara, Ohishi, & Shiigai, 2000; Suzukamo, Ono, & Fukuhara, 2000). The BD subscale contains the following questions: Have you felt any sense of burden in:

- The necessity to keep the protein, energy, and salt intake constant?

- The necessity to make menus?
- The inability to eat your favorite foods?
- The inability to eat the same foods as others at gatherings, etc.?
- The inability to eat the same foods as other family members?
- The necessity to cook or have someone cook the dialytic diet?

For each question, the subjects were asked to choose one of the following responses: definitely true (1 point), mostly true (2 points), don't know (3 points), mostly false (4 points), and definitely false (5 points). Items from each of these domains were scored as Likert scales. Item responses were summed to provide a scale score that ranged from 0 to 100, with a higher score reflecting a lower diet therapy burden.

Statistical Analysis

Baseline demographic, socioeconomic, and laboratory factors are described as the mean \pm standard deviation (*SD*) for continuous variables and frequency distributions for dichotomous variables. The statistical significance of differences between groups was tested using 2-sample *t*-tests for continuous variables and the Chi-square test for categorical variables.

The degree of correlation between continuous variables was assessed using Pearson's correlation coefficient. Predictors of nonadherence were identified using logistic regression. Odds ratio (OR) was for the occurrence of nonadherence as it correlated with a one *SD* decrease in scale score. Variables entered into the multivariate logistic models included age, gender, diuretic use, education, duration of diet therapy, BMI, Kt/V, and diabetes mellitus. The results are expressed as adjusted odds ratios. The patient's residual urine volume was taken into account by adjusting for diuretic use on the basis of a previous study showing that diuretic users had almost twice the odds of retaining residual urine volume (greater than 200 mL of urine output in a 24-hour period) compared with

Table 1
Baseline Characteristics of the Study Population by Fluid Control Adherence

Variable		Overall (n = 72)		Adherence (n = 50)†		Nonadherence (n = 22)†		p Value
Sex, n (%)	Male	45	(62.5)	34	(68.0)	11	(50.0)	0.189
Age, mean (range)	Years	56.7	(22 to 82)	58.1	(32 to 82)	53.4	(22 to 75)	0.143
Education, n (%)	Junior college or above	34	(47.2)	15	(30.6)	1	(4.5)	0.015*
Marital status, n (%)	Unmarried	15	(20.8)	10	(20.4)	5	(22.7)	1.000
Living situation, n (%)	Living with someone	65	(90.3)	45	(90.0)	20	(90.9)	1.000
Employment, n (%)	Employed	27	(37.5)	16	(32.0)	11	(50.0)	0.189
Annual household income, n (%)	< 5 million yen	37	(51.4)	24	(58.5)	13	(72.2)	0.384
	5 to 10	17	(23.6)	14	(34.1)	3	(16.7)	
	>10	5	(6.9)	3	(7.3)	2	(11.1)	
Cause of renal failure, n (%)	Diabetes mellitus	9	(12.5)	6	(12.2)	3	(13.6)	0.156
	Glomerulonephritis	29	(40.3)	22	(44.9)	7	(31.8)	
	Other	33	(47.2)	21	(42.9)	12	(54.5)	
Diabetes mellitus, n (%)	Yes	11	(15.3)	8	(16.0)	3	(13.6)	1.000
Using diuretics, n (%)	Yes	9	(12.5)	8	(16.0)	1	(4.5)	0.259
Duration of dialysis, mean (SD)	Months	112	(101)	87	(88.0)	166	(109)	0.002**
Frequency of dialysis per week, n (%)	2 (times)	1	(1.4)	1	(2.0)	0	(0.0)	0.636
	3	70	(97.2)	48	(96.0)	22	(100.0)	
	4	1	(1.4)	1	(2.0)	0	(0.0)	
BMI, mean (SD)	kg/m ²	21.7	(3.2)	22.2	(3.2)	20.4	(2.9)	0.021*
Hematocrit, mean (SD)	%	32.9	(3.9)	33.1	(4.4)	32.6	(2.8)	0.507
Albumin, mean (SD)	g/dl	3.7	(0.4)	3.7	(0.4)	3.8	(0.3)	0.472
nPCR, mean (SD)	g/kd/day	1.0	(0.2)	1.0	(0.3)	1.1	(0.2)	0.041*
Potassium, mean (SD)	mEq/l	5.3	(0.6)	5.2	(0.6)	5.5	(0.6)	0.046*
Phosphate, mean (SD)	mg/dl	5.5	(0.9)	5.3	(0.9)	5.8	(1.0)	0.022*
Kt/V, mean (SD)		1.7	(0.3)	1.6	(0.3)	1.9	(0.4)	0.000**

Notes: SD = standard deviation, BMI = body mass index, nPCR = normalized protein catabolic rate, IWL = intradialytic weight loss, DW = dry weight.

* $p < 0.05$

** $p < 0.01$

†Adherence IWL/DW less than 5.7%; nonadherence, IWL/DW greater than 5.7%.

nonusers (Bragg-Gresham et al., 2007).

For these analyses, p values less than 0.05 were considered significant. All analyses were done using SPSS (Statistical Package for Social Science, SPSS Inc., Chicago, IL, USA) version 15.0 for Windows. The study protocol was approved by the Ethical Committee of the University of Kyoto. All participants in this study provided written informed consent.

Results

Subjects

A total of 77 patients were invited to participate, of whom 72 agreed, while 5 declined due to work or other scheduling conflicts. Three DMSES and 2 IHLC data were missing.

Background Characteristics

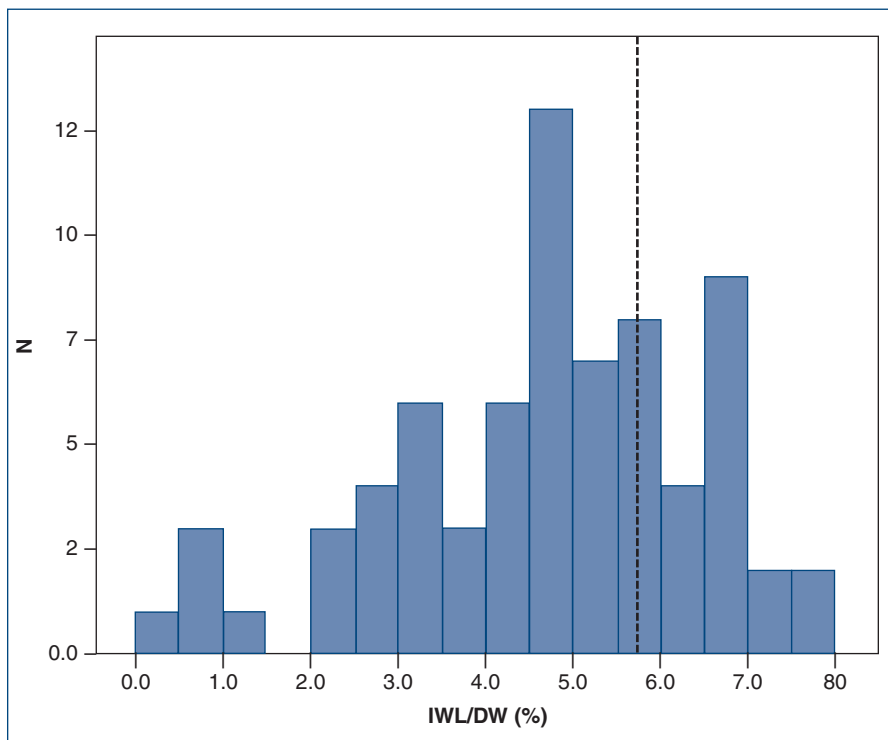
Patients' characteristics are shown in Table 1. Mean age of the adherence and nonadherence groups was 58.1

years (range 32 to 82) and 53.4 years (range 22 to 75), respectively. Significant differences between groups were seen for education, duration of dialysis, BMI, nPCR, serum potassium, serum phosphate, and Kt/V.

Fluid Control Adherence

Figure 1 shows the histogram for IWL/DW. The prevalence of nonadherence, defined as IWL/DW greater than 5.7%, was 30.6% (22/72).

Figure 1
Frequency of Average Intradialytic Weight Loss (IWL)/Dry Weight (DW)
(n = 72)



Note: The dotted line indicates IWL/DW equals 5.7%. IWL/DW greater than 5.7% indicates nonadherence.

Table 2
Relationships Between Psychosocial Factors and Fluid Control
(n = 72)

Variable	Range	Pearson's Correlation Coefficient				IWL/DW (%)
		DMSES	IHLC	MH	BD	
DSE†	0 to 100	0.19	0.20	0.04	0.21	-0.30*
DMSES†	0 to 36		0.03	0.18	0.42*	-0.14
IHLC†	0 to 30			-0.01	0.18	-0.10
MH†	0 to 100				0.44*	-0.09
BD†	0 to 100					-0.14

Notes: DSE = dialysis staff encouragement, DMSES = dietary management self-efficacy scale, IHLC = internal health locus of control, MH = mental health, BD = diet therapy burden, IWL = intradialytic weight loss, DW = dry weight.

*Pearson's correlation coefficient $r > 0.3$ or $r < -0.3$.

†Higher scale scores denote better condition.

Psychosocial Factors

The association between psychosocial factors and IWL/DW is shown in Table 2. DSE correlated with patient fluid control (Pearson's correlation coefficient $r = -0.30$). Associations between HBM components are also shown in Table 2. BD correlated with DMSES ($r = 0.42$) and MH ($r = 0.44$). Scores for psychosocial factors in the adherence and nonadherence groups are found in Table 3. The mean DSE score differed statistically and significantly between the groups ($p = 0.03$).

The crude and adjusted analysis results obtained using logistic regression are included in Figure 3. Crude odds ratio and 95% confidence interval (CI) were estimated for the occurrence of nonadherence as it correlated with a one SD decrease in DSE score (OR: 1.75 [95% CI: 1.02 to 3.0]). The association remained closely similar even after adjustment for sex, age, diuretic use, education, duration of dialysis, Kt/V, BMI, and diabetes mellitus (OR: 2.51 [95% CI: 0.99 to 6.34]) (see Figure 2). Crude odds ratios of nonadherence for each one SD decrease in scale score were 1.51 (95% CI: 0.89 to 2.56) for DMSES, 1.46 (95% CI: 0.87 to 2.46) for IHLC, 1.10 (95% CI: 0.67 to 1.82) for MH, and 1.23 (95% CI: 0.74 to 2.05) for BD.

In the adjustment model, a lower diet therapy burden, defined as a higher BD score, was associated with significantly greater fluid control adherence (OR: 2.37 [95% CI: 1.04 to 5.40]) (see Figure 2). The adjusted odds ratios of nonadherence for each one SD increase in scale score were 2.27 (95% CI: 0.99 to 5.21) for DMSES, 1.89 (95% CI: 0.76 to 4.70) for IHLC, and 1.49 (95% CI: 0.71 to 3.15) for MH.

Discussion

The results of this study of the relationship between patients' perceptions of dialysis staff encouragement and fluid control adherence and the association between adherence and HBM components (such as self-efficacy)

Table 3
Comparison Between Adherence and Nonadherence to Fluid Control Requirements

Psychosocial Variables								
Variable	Range	Overall (n = 72)		Adherence (n = 50)†		Nonadherence (n = 22)†		p value
		Mean	(SD)	Mean	(SD)	Mean	(SD)	
DSE‡	0 to 100	73.4	(18.6)	76.5	(16.5)	66.5	(21.6)	0.03*
DMSES‡	0 to 36	24.0	(4.8)	24.6	(4.4)	22.6	(5.6)	0.12
IHLC‡	0 to 30	24.4	(4.3)	24.9	(3.3)	23.3	(6.1)	0.14
MH‡	0 to 100	69.9	(19.3)	70.5	(18.4)	68.6	(21.6)	0.71
BD‡	0 to 100	65.1	(20.0)	66.3	(18.2)	62.2	(23.8)	0.42

Notes: DSE = dialysis staff encouragement, DMSES = dietary management self-efficacy scale, IHLC = internal health locus of control, MH = mental health, BD = burden of diet therapy, SD = standard deviation, IWL = intradialytic weight loss, DW = dry weight.
 *p < 0.05
 †Adherence, IWL/DW less than or equal to 5.7%; nonadherence, IWL/DW greater than or equal to 5.7%.
 ‡Higher scale scores denote better condition.

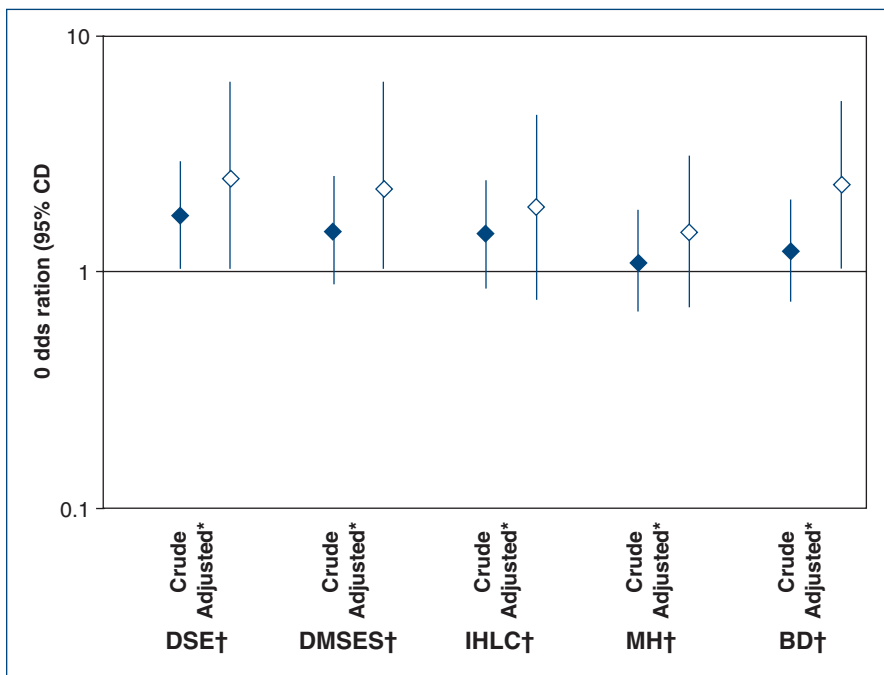
cy, health locus of control, and psychological burden) suggest that fluid control adherence is correlated with dialysis staff encouragement and other HBM components. Crude analysis showed that only DSE was significantly associated with adherence, while multiple analysis showed that BD was only significantly associated with fluid control adherence. To the authors' knowledge, this is the first study to examine the relationship between the DSE subscale of the KDQOL and fluid control adherence.

Factors and outcomes in the present study were measured by validated methods. Further, despite the fact that patients with increased urine output had significantly higher interdialytic weight gain (Lee & Molassiotis, 2002; Richard, 2006), many previous studies did not adjust for residual renal function or urine output. Here, however, urine output was adjusted for diuretic use, providing greater accuracy regarding this variable than these previous studies.

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Crude analysis of these data showed a significant correlation between patient perception of DSE (KDQOL subscale) and an increase in fluid control adherence. These

Figure 2
Psychosocial Factors of Fluid Control Adherence (n = 72)



Notes: Odds ratios and 95% confidence intervals (CIs) were estimated for the occurrence of nonadherence as it correlates with a one standard deviation decrease in scale score.

Dialysis staff encouragement (DSE) ranged 0 to 100; dietary management self-efficacy scale (DMSES) (0 to 36); internal health locus of control (IHLC) (0 to 30); mental health (MH) (0 to 100); burden of diet therapy (BD) (0 to 100). Higher scale scores of these scales denote better condition.

*Adjusted for age, sex, diuretic use, education, duration of dialysis, Kt/V, BMI, and diabetes mellitus.

associations almost remained even after adjustment for gender, age, diuretic use, education, duration of dialysis, Kt/V, BMI, and diabetes mellitus. Results of this current study are consistent with previous results, indicating that the perception of social support was related to better survival or good adherence (Christensen et al., 1992; Kimmel, 2000; Kimmel et al., 1998; Kimmel et al., 1996; Loghmain-Adham, 2003; Obrien, 1990; Patel et al., 2005).

Social support can enhance the individual's ability to access new contacts and information, and to identify and solve problems (Heaney & Israel, 2002; Loghmain-Adham, 2003). Social support may also diminish the negative effects of exposure to stressors, such as depression, loneliness, burden of disease, and acceptance of disease (Heaney & Israel, 2002). Therefore, patients who perceive that the dialysis staff supports them may communicate better, and thus, have a better chance of receiving tailored medical and nutritional information.

Patients on dialysis interact with dialysis staff at every dialysis session. Patients who perceive dialysis staff encouragement to adhere to fluid control restrictions may do so to maintain good relations with dialysis staff.

Components of the Health Belief Model and Fluid Control Adherence

The HBM explains health-related behaviors, the key concepts of which include self-efficacy and perceived benefits and barriers (Janz et al., 2002). Self-efficacy and health locus of control are defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 193). "If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control" (Rotter, 1966, p. 1). Patients who have greater self-efficacy or internal health locus of control are thought to achieve greater adherence as they actively take part in health

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behavior and overcome perceived barriers.

Further, it is generally believed that people will be compliant with regard to healthy behavior if they believe that the anticipated barriers are outweighed by the benefits (Janz et al., 2002). Results from the current study are consistent with previous studies reporting associations between greater self-efficacy (Oka & Chaboyer, 2001; Takaki & Yano, 2006; Zrinyi et al., 2003), greater internal health locus of control (Sensky, Leger, & Gilmour, 1996; Takaki & Yano, 2006), greater perceived barriers (Kaveh & Kimmel, 2001), better psychological condition (Akman et al., 2007; Taskapan et al., 2005), and greater adherence.

Some limitations of this study warrant mention. First, the study was cross-sectional, and therefore, cannot determine causality. It is possible that patients who adhere to fluid control requirements have a better relationship with dialysis staff and an improved perception of dialysis staff encouragement. Second, the external validity of this study may be limited. Here, for example, patients whose primary cause of kidney disease was diabetic nephropathy accounted for only 12.5% of subjects (9/72), but for 27.7% in the Japan-Dialysis Outcomes Practices Pattern study (1141/4115) (Tanaka et al., 2007). Present subjects were also participants in a validation study for a diet questionnaire, and it is therefore possible that only physically and mentally well patients were

selected. Selection bias may also have resulted from the characteristics of the hospitals and region. Third, information bias should be considered. Nonadherent patients may have invoked responses (comments and recommendations) from the dialysis staff that lead to a lower perception of encouragement (Kovac et al., 2002). Conversely, adherent patients may have been praised by dialysis staff, which could have lead to a greater perception of encouragement (Kovac et al., 2002). On this basis, the relationship may have been driven by patient adherence, at least in part. Fourth, a definition of fluid control adherence has not been established. The authors have used a cutoff defined by Leggat et al. (1998), but the clinical relevance of this cutoff value remains controversial (Denhaerynck et al., 2007). Finally, the sample size was small, likely limiting statistical power in detecting significant associations. The present findings should be confirmed in a larger sample size with objective verification of the test hypothesis. Moreover, qualitative research is needed to clarify the efficacy and feasibility of encouragement, as well as patient perception of the benefit of dialysis staff encouragement.

Conclusion

Fluid control has a direct bearing on outcome in patients undergoing dialysis, but is one of the most difficult restrictions with which to comply.

This situation highlights the importance of effective interventions to fluid control.

Results from this current study indicate that in addition to HBM components, patient-perceived encouragement from dialysis staff is an important factor in improving fluid control adherence. These data cannot determine causality. However, even from the perspective that the patient's behavior drives the encouragement-adherence relationship, the ability of a dialysis staff member to discuss and relate to the concerns of less-adherent patients in a positive manner should improve the perception of dialysis staff encouragement and increase adherence behavior (Kovac et al., 2002). Further, given the regular and extended periods of time patients on dialysis spend in the hospital setting, dialysis staff support is one of the most feasible of the various social support systems available. The relationships between patients on dialysis and nephrology nurses are often long (Barnett, Yoong, Pinikahana, & Si-Yen, 2008), and a nephrology nurse is one of the most important dialysis staff to potentially improve patient perception of the dialysis staff encouragement. Therefore, it is important to clarify how nurses intervene with patients on hemodialysis to improve patient perception of the dialysis staff encouragement in the future.

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1. What would be different in your practice if you applied what you have learned from this activity?

GOAL To provide an overview of the importance of dialysis staff encouragement and fluid control adherence in patients on hemodialysis.

Please note that this continuing nursing education activity does not contain multiple-choice questions. This posttest substitutes the multiple-choice questions with an open-ended question. Simply answer the open-ended question(s) directly above the evaluation portion of the Answer/Evaluation Form and return the form, with payment, to the National Office as usual.

Evaluation

- By completing this offering, I was able to meet the stated objectives
 - Describe the relationship between patients' perceptions of dialysis staff encouragement and fluid control adherence as outlined in this study.
 - Discuss the components of the health belief model and fluid control adherence.
- The content was current and relevant.
- This was an effective method to learn this content.
- Time required to complete reading assignment: _____ minutes.

	Strongly disagree				Strongly agree
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	

I verify that I have completed this activity _____
 (Signature)