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Supportive Educative Nursing Intervention (SENI) as Intervention in Enhancing Self-Efficacy among Hemodialysis Patients

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ABSTRACT

Fluid restriction is the hardest regimen to follow in chronic kidney disease patients receiving hemodialysis, leading to an increase of Interdialytic Weight Gain (IDWG) with several complications. Supportive Educative Nursing Intervention (SENI) Orem's theory is innovative method with the goal of enhancing fluid restriction self-efficacy, and thus have a positive impact on controlling IDWG as an objective marker of fluid restriction adherence. This study aimed to determine the effect of Supportive Educative Nursing Intervention (SENI) on self-efficacy among CKD patients. This study adopted a quasi-experimental, pre and post test with control group design, which was conducted at the RSUD. Dr. M Yunus Bengkulu, Indonesia involving 80 hemodialysis patients. Self-efficacy was measured using the Indonesian Fluid Intake Appraisal Inventory (I-FIAI). Data were collected at baseline, 1 week, and 2 weeks after intervention. Data were analyzed using Repeated ANOVA. Repeated ANOVA test showed a statistically significant difference in mean score self- efficacy (p=0.000). An increase mean score self- efficacy of intervention group was higher than control group (p<0.05). Supportive Educative Nursing Intervention (SENI) Orem's theory increases self-efficacy of hemodialysis patients in fluid restriction.

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Introduction

Chronic Kideney Disease is a major health problem worldwide and is considered a key factor in poor health outcomes for most noncommunicable diseases, including cardiovascular disease, hypertension, and diabetes mellitus [1]. The burden of CKD is growing rapidly around the world [2]. The global estimated prevalence of CKD is 13.4% (11.7–15.1%), and increased by 7% annually [3,4]. Prevalence of CKD in Indonesia increase 0.38% with total of patients receiving hemodialysis are198,275, it twofold increase over the previous year [5].

Patients receiving HD are expected to adhere recommended therapeutic regimens such as fluid restrictions, prescribed medications, dietary guidelines and routine dialysis sessions to maintain their health, prevent complications, and improve quality of life [6,7]. Previous studies have identified that non-adherence in fluid restriction is the main problem experienced by hemodialysis patients [8]. Non-adherence in fluid restriction causes an increase weight gained between dialysis sessions or called Interdialytic Weight Gain (IDWG) [9]. IDWG is used as a parameter for fluid and salt intake between the two sessions of HD [10]. Excessive of IDWG causes various complications i.e cardiovascular disease, risk of premature mortality and decreased quality of life [11].

Self-efficacy is a major predictor of fluid restriction adherence in hemodialysis patients [12]. Self-efficacy describes the expectation of an individual regarding their capacity in terms of a behavior or action to achieve a particular outcome [13]. Innovations that aim to improve self-efficacy and facilitate patient self-care are important thing to do. One of these innovations is Supportive Educative Nursing Intervention (SENI) Orem's theory. SENI describes several nursing methods which include teaching, supporting, guiding, and developmental environment to assist patients in improving self-efficacy, and self- care behavioral in the hope that patients will be able to require independent care [14]. SENI is simple intervention, inexpensive, and practical to provide [15].

Supportive Educative Program was effective for increasing self-care for heart failure patients, increasing maternal knowledge & attitude of fedding practice, increasing blood pressure control in hemodialysis patients, and improving control of blood glucose levels in DM patients [14-17]. Meanwhile, there aren't studies of Supportive Educative Nursing Intervention (SENI) that combines 4 methods of Nursing System Orem's theory, measures self-efficacy of fluid restriction in hemodialysis patients.

Literature Review

Supportive Educative Program was effective in improving control of blood glucose levels in DM patients [17]. This study used 2 methods of Orem's theory in their study i.e "teaching" trough group education and "supporting" trough individual follow up by phone. Supportive Educative Nursing Program helped heart failure patients in improving self-care

(Laksmi et al., 2020). Ref. [16] gave supportive-educational program, a structured educational program with nurse assistance by telephone and home visits equipped with booklets and self-care management videos for heart failure.

Supportive Educative Nursing Program has a significant influence on increasing the knowledge and attitudes of mothers in feeding stunting toddlers. Ref. [16] distributed booklets to respondents in their study. The researcher reviews the material that has been presented at the previous meeting. Furthermore, the researchers asked and discussed the difficulties experienced by respondents. Supportive Educative Nursing Intervention could in increasing blood pressure control in hemodialysis patients. Ref. [14] used two methods i.e ”teaching” through education, ”guiding” through monitoring and goal setting for 12 weeks intervention. Meanwhile, there aren't studies of Supportive Educative Nursing Intervention (SENI) that combines 4 methods of Nursing System Orem's theory, measures self-efficacy among hemodialysis patients.

Methods

A. Research Context

This study adopted quasi-exsperimental, pre test and post test with control group design. This study was conducted on 3th May to 2th Juny 2018 in the hemodialysis installation of RSUD Dr. M. Yunus Bengkulu, Indonesia. Population in this study were all patients with a diagnosis of CKD who receiving hemodialysis at RSUD Dr. M. Yunus Bengkulu. Inclusion criteria included age 18-60 years, receiving hemodialysis twice a week, having interdialytic weight gain>2.5 kg in 2 hemodialysis sessions, have a personal mobile phone, be able to use the Short Message Services (SMS), receiving hemodialysis at least 6 months, be able to read, write, and communicate effectively. The exclusion criteria was patients in an emergency. Eighty two hemodyalisis patients participated in this study consisting of 41 respondents in each group. During the study process, 1 respondent in intervention group died and 1 respondent in control group didn't take post test II, so total respondents analyzed were 80 respondents.

B. Procedure (Intervention)

1. Intervention Group

   Intervention group received SENI based on 4 Orem's theory methods, (1) “teaching” through audio visual education, (2) “supporting” respondents received fluid restriction reminder 3 times a week when waiting for the next HD schedule, (3) “guiding” through monitoring daily fluid intake used supported monitoring book (4) “developmental environment” respondents were given SENI Module by researcher. SENI was conducted in two sessions, session I in Ist week and session II in 2nd week.

Session I was started with measuring IDWG, filling out the characteristic demografi and self-efficacy questionnaire. Bedside audiovisual education (video animation) was carried out individually using a tablet . The content of the educational sessions was developed by researcher that aim to explain concept of CKD, factors affecting success of hemodialysis treatment, impact of fluid restriction non-adherence, concept of IDWG, fluid intake recommendations, 24-hour urine measurement, fluid intake and thirst management.

Furthermore, patients were taught to monitor daily fluid intake and record it in monitoring book during interdialytic periods. At the end this session, SENI Module and monitoring book was provided for each respondent to facilitate monitoring of behaviors related to fluid restriction. Researcher sent fluid restriction reminder 3 times a week when respondent was waiting for the next HD schedule, reminder message sent at 07.00 WIB. In session II, the intervention group received the same treatment as the first week i.e SMS reminder, guidance and review of fluid intake monitoring.

2. Control Group

   The control group received two interventions based on Orem's theory methods which involved “guiding” and “developmental environment”. In session I of intervention, respondents asked to filling out the questionnaire. Furthermore, respondents were taught by researcher to monitor daily fluid intake and record it in monitoring book during interdialytic periods. Respondents also were given a SENI module.

3. Instrument

   Outcome of this study is self-efficacy of fluid restriction. The Indonesian Fluid Intake Appraisal Inventory (I-FAI) was used to measure self-efficacy of hemodialysis patients in fluid restriction. I-FAI consist of 33 questions and divided into 4 components (physiological factor, affective factor, social factor, and environmental factor). The total score ranged from 0-330. Indonesian Fluid Intake Appraisal Inventory (I-FAI) has excellent content validity with the I-CVI values 0.937 and the S-CVI values 0.919, as well as consistency of internal reliability with Cronbach's alpha 0.86 [12].

4. Ethical consideration

   The research protocol was received and obtained ethical approval from the Research Ethics Commission of the Faculty of Medicine, Public Health, and Nursing Universitas Gadjah Mada with no KE/FK/0422/EC/2018.

5. Data analysis

   The normality of the data were analyzed using Shapiro-Wilk. Repeated ANOVA used to determine the difference of self-efficacy in each groups before and after

interventions. Independent t-test used to determine comparison of self-efficacy between two groups before and after the intervention.

Results

A. Demographic characteristics

Homogeneity test of demogafi characteristic respondents showed that there wasn't significant difference between two groups at baseline (p>0.05), so it can be concluded demographic characteristics of the respondents in the intervention and control groups was homogeneous (Table 1).

Table 1. Example table Characteristics of Respondents

		Group				
		Intervention		Control		p-value[a]
		F	%	f	%	
Gender	Male	20	50	21	52.5	0.823
	Female	20	50	19	47.5	
Age	17-25 years	2	5	0	0	0.211
	26-35 years	4	10	5	12.5	
	36-45 years	5	12.5	12	30	
	46-55 years	18	45	13	32.5	
	56-65 years	11	27.5	10	25	
Duration of HD	6-12 months	13	32.5	16	40	0.732
	13 months - 5 years	19	47.5	18	45	
	> 5 years	8	20.0	6	15	
Education	Basic	17	42.5	8	20	0.094
	Middle	12	30.0	16	40	
	High	11	27.5	16	40	
Urine output	Anuria	27	67.5	21	52.5	0.171
	Oligouria	13	32.5	19	47.5	
Occupation	Does not work	22	55.0	18	45	0.455
	Civil Servant	6	15.0	12	30	
	Retired	2	5.0	3	7.5	
	Private	6	15	5	12.5	
	Farmer	2	5	2	5	
	Trader	2	5	0	0	
Marital status	Married	37	92.5	39	97.5	0.132
	Single	3	7.5	0	0	
	Widow/widower	0	0	1	2.5	
Comorbidities	Diabetes	8	20	4	10	0.062
	Diabetes. hypertension	2	5	6	12.5	
	Hypertension	27	67.5	24	60	
	Hypertension + others	0	0	5	12.5	
	Heart Disease	1	2.5	1	2.5	
	Nothing	2	5	0	0	
Fasting	No	20	50	21	52.5	0.823
	Fasting	20	50	19	47.5	

B. Baseline data of self-efficacy

Mean scores of self-efficacy before intervention in the intervention group 141.32 (± SD 19.82) and 142.48 (± SD 19.67) in the control group. Homogeneity test of self-efficacy in both groups showed p=0.795 at baseline. This indicated that the data was homogeneous (p>0.05) (Table 2).

Table 2. Comparison of self-efficacy before SENI in the intervention and control group

	Group	N	Mean±SD	Median (min-Max)	CI 95%	*p*-value
SE Pre test	Intervention	40	141.32±19.82	142.50 (107.00-197.00)	134.98-147.66	
	Control	40	142.48±19.67	142.00 (102.00-179.00)	136.18-148.76	0.795 [b]

[b] *Independent samples test*

C. Self-efficacy before intervention (pre-test), one week after intervention (post-test I), and two weeks after intervention (post-test II) in the intervention and control groups

The repeated ANOVA test showed a statistically significant self-efficacy score in each group in 3 time measurements (pre-test, post-test I, and post-test II) with *p*=0,000 (p<0,05).

Table 3. Self-efficacy scores of pre-test, post-test I, and post-test II hemodialysis patients

		SE Pre test Mean±SD	SE Post test I Mean±SD	SE post test II Mean±SD	*p*-value[d]
Intervention (n=40)	Range				
Total	0-330	141.32± 19.82	184.10±19.35	228.35±18.68	0.000
Physiological	0-100	44.65±7.25	56.50±6.72	70.65±5.86	0.000
Affective	0-50	24.30±4.52	29.35±3.99	35.93±3.58	0.000
Social	0-110	46.15±6.20	61.25±6.69	75.00±6.78	0.000
Environmental	0-70	26.22±4.69	37.00±4.06	46.77±4.49	0.000
Control (n=40)					
Total	0-330	142.48±19.67	172.62±20.16	206.48±19.00	0.000
Physiological	0-100	44.25±6.78	53.33±7.04	64.27±5.72	0.000
Affective	0-50	23.88±3.47	27.45±3.17	32.78±3.35	0.000
Social	0-110	47.10±7.35	57.45±7.61	68.27±6.80	0.000
Environmental	0-70	27.25±4.98	34.40±4.31	41.15±4.83	0.000

[d] *Repeated ANOVA test*

D. Comparison of Self-efficacy before intervention (pre-test), one week after intervention (post-test I), and two weeks after intervention (post-test II)

Table 4 shows this results.

Table 4. The difference mean score self-efficacy of hemodialysis patients before and after the intervention

	Group Intervention (n=40) Mean±SD	Control (n=40) Mean±SD	Effect Size	*p*-value[b]
DifferencePre-post1	42.78±17.98	30.15±15.72	0.748	0.001*
DifferencePre-Post II	87.03±23.60	64.00±20.01	1.053	0.000*
DifferencePost I-Post II	44.25±15.21	33.85±17.34	0.638	0.006*

[b]*Independent sample t-test; statistically significant; ES: effect size value; ES=0,2 (small effect), ES=0,5 (medium effect), dan ES=0,8 (large effect)*

Independent sample t-test showed that there was a significant difference mean self-efficacy between both of groups after intervention with an average increase higher in the intervention group compared to the control group (*p*<0.005). Effect size on the Independent t-test using *d*- value, and in the pre-test post-test II *d*-value>0.80, so it can be concluded that SENI clinically has a large effect size on increasing self-sefficacy after 2

weeks of intervention and has a medium effect size (d>0,5) in pre-post I and post I-post II [19].

Discussion

There was no differences in self-efficacy scores between two groups at baseline indicating that the variables were homogeneous. This condition will support and strengthen validity of the study because in a quasi-experimental pre-post-test design, if respondents had the same characteristics before intervention, so difference in the result was the effect of intervention [20].

SENI implemented in this study consisted of audio visual education (teaching), monitoring fluid intake guidance supported by monitoring book (guiding), fluid restriction reminder (supporting), provided SENI module (developmental environment). SENI has a statistically significant effect on increasing self-efficacy after one week of intervention (post test I) and two weeks after intervention (post test II) compared to baseline. Ref. [21] reported that self-efficacy training supported by booklet can increase self-efficacy and decrease body weight gain in hemodialysis patients. Some previous studies also showed that supportive educative nursing programs could improve health outcomes of patients with chronic diseases [14,17,18].

Education enhanced self-efficacy by meeting one source of self-efficacy i.e performance attainment [21]. Media for delivering material can support education, one of the interesting and interactive media is audio visual. Audio visual education (video) in this study was carried out individually at the patient's bedside. Respondents stated that the video showed very useful for them, not boring, they can illustrate the real condition through pictures and sounds, could see the process more clearly, and learning through video was easier to understand than just reading. Ref. [22] also reported that structured education using audio visual media was more effective than visual media (leaflets) in improving the fluid restriction self-efficacy in hemodialysis patients.

Respondents received support through a reminder message (personally tailored SMS), in which the message content adjusted to patient's condition. SMS reminder will motivate and direct patients to remember their tasks during treatment period such as limiting fluids according to recommendations, managing fluids and thirst, and help to remind the increase of the last IDWG. In this study, some respondents gave positive response. Respondents felt happy because they were given attention, health tips, and reminded to control fluid intake. Reminder messages helps improve self-efficacy by meeting one of the sources of self-efficacy i.e physiological state. SMS reminder containing health tips and motivation allows direct

communication and strengthening to change behavior according to health recommendations [23].

Guiding methods were carried out through fluid intake monitoring guidance using a fluid monitoring book. In this study, monitoring fluid intake was supported by giving measuring cups. Giving a measuring cup to HD patients aimed to make them easier to measure the amount of fluids, and direct patients to plan daily fluid intake. In addition, monitoring review were carried out at every HD session to determine if predetermined goals had been met. Ref. [14] states fluid monitoring is one of the proactive strategies involving patients directly in disease management and adaptation mechanisms, so patients will have good motivation and ability to meet their care needs. Guidance and review of fluid monitoring increases self efficacy by meeting one source of self-efficacy i.e verbal persuassion, where it can be given through instructions, advice, or suggestions [13]. The developmental environment method was carried out by providing SENI Module look like a flip chart. It can be used as a learning material for patients when at home. Several previous studies showed that the provision of learning media (module) can improve knowledge and self-care ability of patients with chronic diseases [5,23].

Self-efficacy increased significantly in intervention and control group at post test I, and post test II (p<0.05). Possible explanations for this finding is the control group also receives one of the proactive interventions i.e fluid monitoring guidance supported by monitoring book and module in improving patient's self-efficacy. Ref. [15] stated that self-monitoring was a corner stone of behavioral intervention, so individual need to integrate self-care knowledge and skills in everyday life to bring behavioral change. Self-monitoring has a function as self-motivation that will make an individual become more aware of his needs, acquire skills, and plan his own care [14].

Self-efficacy of both groups increased significantly, but increasing mean score of self-efficacy in the intervention group was higher than control group. This is supported by a large effect size (d>0.8) in the pre-post test II which showed that SENI clinically had a large effect on increasing self-efficacy. Self-efficacy was higher in the intervention group compared the control group, possible explanations for this finding is the more complex interventions provided, the better outcomes can be achieved. The control group received fluid monitoring guidance and module, but didn't receive SMS reminder and audio visual education as in the intervention group. Ref. [14] stated that other interventions such as monitoring, goal setting, and reinforcement were needed to support education, so that improved self-care capabilities and self-care behaviors in fluid restriction could be achieved well.

Conclusion

Supportive Educative Nursing Intervention (SENI) increases self-efficacy of

hemodialysis patients in fluid restriction. An increase mean score self- efficacy of intervention group was higher than control group.

Limitation and Suggestions

This study had several limitations:

1) Monitoring fluid intake is one part of SENI. Researcher can't ensure that respondents monitor daily fluids properly at home. Researchers tried to control by giving patients measuring cups. It made patients easier to measure fluid intake.
2) During sending of reminder messages, the goal was SMS sent, but researchers couldn't monitor

   directly and ensure that respondents had actually read reminder messages. Researchers confirmed directly to patients when hemodyalisis session.
3) Researchers were involved in the data collection process (pre-test, post-test I, and post-test II), as well as providing interventions for respondents in the intervention and control groups. This can lead to bias in results of study.

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Conflict of Interest

The author declare no conflict of interest in this study.

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