Nurse Media Journal of Nursing, 10(2), 2020, 171-181
Available online at http://ejournal.undip.ac.id/index.php/medianers
DOI: 10.14710/nmjn.v10i2.26502

Effects of Peer Support Program on Self-Management in Patients with End-Stage Renal Disease Undergoing Hemodialysis

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Received: 13 November 2019 Revised: 20 August 2020 Accepted: 21 August 2020

ABSTRACT

Background: Patients with End-Stage Renal Disease (ESRD) undergoing hemodialysis require proper self-management of lifestyle changes to minimize risks of complications, morbidity, and mortality. Efforts made to improve self-management in hemodialysis patients in previous studies were mostly carried out by health workers that may not provide 'real' knowledge, while peer support programs carried out by patients as peers to share their experiences may provide more benefits.
Purpose: The purpose of this study was to determine the effects of peer support programs on improving self-management in patients with ESRD undergoing hemodialysis.
Methods: This study employed a quasi-experimental design and involved a total of 33 patients in the control group and 32 patients in the intervention group, who met the inclusion and exclusion criteria. The samples were recruited consecutively. The intervention of peer support programs was implemented through information support, emotional support, and mutual reciprocity in groups of 10-12 people to share experiences related to their self-management. The intervention was given for six sessions; each lasted for 30-45 minutes. The data were collected using the Indonesian version of the hemodialysis self-management instrument (HDSMI) and analyzed using the paired-sample t-test and independent-sample t-test.
Results: The results showed that after the intervention, the mean score of self-management in the intervention group increased from 79.47±7.919 to 90.75±7.089, and in the control group, the mean increased from 81.88±8.291 to 82.12±7.692. After the implementation of peer support programs, there was a significant difference in the score of self-management between the intervention group and the control group ($p<0.001$).
Conclusion: Peer support programs gave an effect on increasing self-management in patients with ESRD undergoing hemodialysis. Peer support programs should be introduced early to ESRD patients undergoing hemodialysis so that they can learn about self-management from other patients.

Keywords: End-stage renal disease; hemodialysis; peer support; self-management

How to Cite: Husain, F., Kusuma, H., & Johan, A. (2020). Effects of peer support program on self-management in patients with end-stage renal disease undergoing hemodialysis. *Nurse Media Journal of Nursing, 10*(2), 172-182. doi:10.14710/nmjn.v10i2.26502
Permalink/DOI: https://doi.org/10.14710/nmjn.v10i2.26502

BACKGROUND

Kidney failure is recognized as a major health problem that contributes to an increased rate of morbidity and mortality. Global Burden of Disease (GBD) shows that there are 1.2 million people died from kidney failure in 2015, with an increase of 32% since 2005 (Wang et al., 2016). In Indonesia, the data from the basic health research showed that there is an increased prevalence of End-Stage Renal Disease (ESRD) from 0.2% in 2013 to 0.38% in 2018 (Ministry of Health Republic of Indonesia [MoHRI], 2019). Patients with ESRD require therapies to replace decreased kidney function, including hemodialysis (HD), peritoneal dialysis (PD), and kidney transplant (Smeltzer, Bare, Hinkle, & Cheever, 2010).

Hemodialysis is the most widely used kidney replacement therapy for ESRD patients. A majority of patients chose HD (86.9%) over PD (10.1%), and kidney transplant (2.9%) as the modality in the USA (Saran et al., 2019). The number of patients undergoing HD in Indonesia increased dramatically in the last 3 years, recorded as many as 52,835 patients in 2016, 77,892 patients in 2017, and 132,142 patients in 2018 (Indonesian Renal Registry, 2018).

The global mortality rate of hemodialysis patients is 16.9-26.7 (death/100 patients per year) in the first year (Robinson et al., 2014). Cardiovascular disease (CVD) is a highly common complication and becomes the first cause of death in ESRD patients (Cozzolino et al., 2018; Magalhaes et al., 2017). Hemodialysis requires essential lifestyle changes such as consistent attendance at a dialysis unit for treatment, restriction of fluid intake, diet, and taking medications (Li, Jiang, & Lin, 2014). Such lifestyle changes are strongly influenced by increasing self-management.

Self-management is a collaborative activity between patients and health workers that aims to minimize the impact of chronic diseases on health status and function, through managing diseases, making decisions about needed self-care, identifying problems, setting goals, and monitoring and managing symptoms that arise (Rijken, Jones, Dixon, & Anna, 2008; Ryan, 2009). Most of the patients with ESRD undergoing HD (57.4%) in a previous study reported lower self-management levels (Gela & Mengistu, 2018). Efforts to improve self-management in HD patients and maintain the patients' condition to remain optimal are ways to reduce mortality, morbidity and improve the quality of life of patients (Guney et al., 2012; Lin, Liu, Hsu, & Tsai, 2017). Interventions to improve self-management may include education and counseling, self-management programs, self-efficacy training, self-monitoring programs, and social support (Husain, Johan, & Kusuma, 2019).

The self-management of HD patients is influenced by knowledge, self-efficacy, and social support (Li et al., 2014). Research showed that positive social facilitation enhances self-regulation and engagement in self-management behaviors (Ryan, 2009). Health literacy and social support play independent positive roles in the self-management behavior of patients with kidney disease, with social support having a particularly dominant role (Chen et al., 2018). Social support through peer support programs in previous studies was evident to improve adherence to treatment management in chronic conditions (Haidari, Moeini, & Khosravi, 2017; Yin et al., 2015).

In previous studies, peer support programs in HD patients had focused on psychological outcomes (Irajpour, Hashemi, Abazari, Shahidi, & Fayazi, 2018; Malek-Khahi, Milani, & Amiri, 2015), and carried out by health workers (Mahjubian, Bahraminejad, & Kamali, 2018). While health workers may not be able to provide 'real' knowledge that is derived from the real-life experience of HD patients, how it feels, and how self-management is implemented (Taylor, Gutteridge, & Willis, 2016), it is, therefore, important to investigate how peer support affects self-management in HD patients.

PURPOSE

This study aimed to determine the effects of peer support programs on improving self-management in patients with end-stage renal disease (ESRD) undergoing hemodialysis.

METHODS

Research design and samples

This study used a pre-test and post-test quasi-experimental design with a control group. The samples were HD patients in a public hospital in Semarang, Indonesia, recruited by consecutive sampling with a total of 33 patients in the control group and 32 patients in the intervention group. The inclusion criteria were ESRD patients undergoing routine HD twice a week for ≥3 months, aged ≥18 and ≤65 years old, compos mentis, willing to complete a series of peer support programs, not having hearing loss and verbal disorders, graduating from elementary to high school, and being able to read and communicate in the Indonesian language. The exclusion criteria were patients with hospitalization and experienced major depression and dementia. The participants' flowchart in this study is presented in Figure 1.

Measurements

The self-management measurement tool in HD patients was stated in Li et al. (2014), i.e., the HD Self-Management Instrument (HDSMI), consisting of four components, namely partnership, problem-solving, self-care, and emotional management. The researchers used the Indonesian version of the questionnaire as used in a previous study by Astuti (2016). The questionnaire consisted of 32 items and was declared valid and reliable with a validity value of 0.331-0.799 and an alpha Cronbach value of 0.898 (Astuti, 2016). This instrument was used to measure patients' self-management before (pre-test) and after (post-test) the intervention of peer support programs.

Data collection procedure

One week before the intervention, the patients filled out the self-management questionnaire that had been prepared (pre-test). Peer support programs through

informational support, emotional support, and mutual reciprocity were carried out in groups of 10-12 people to share the experiences of self-management for 6 times, 2 times/week, and 30-45 minutes per meeting.

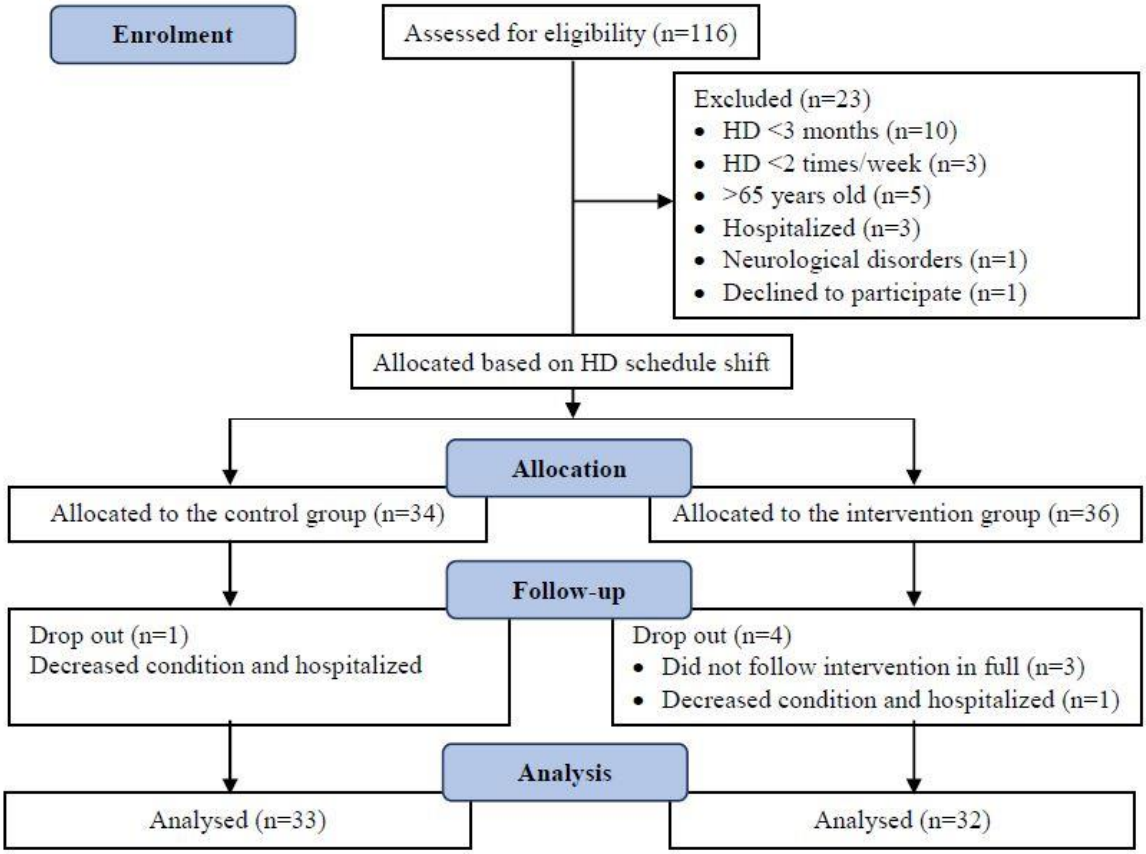

Figure 1. Participants flowchart in the study

The intervention activities are presented in Table 1. One week after the intervention, the patients were measured for self-management using the same questionnaire (post-test). In this study, the patients in the control group were given peer support program manuals books and education about HD self-management after the post-test.

Table 1. Schedule of peer support programs

Session	Activities	Description
Session 1	Formation of group and selection of peer leaders	Patients were grouped based on the same shift schedule. Researchers distributed peer support program manual books and led discussions to explore difficulties regarding self-management in patients. Each group determined the peer leader and planned further discussions. Peer leaders were selected based on group agreement and those who were willing to lead the discussion in the group. Researchers explained the role of the peer leaders.

Session	Activities	Description
Session 2	Fluid restriction management	Peer leaders led the groups to share experiences on non-compliance with fluid restrictions (e.g., swelling, shortness of breath), and on strategies for limiting fluid, how to calculate the maximum fluid consumption, how to manage thirst, and how to monitor interdialytic weight gain (IDWG).
Session 3	Nutrition management	Peer leaders led members to share their experiences of foods that might cause health problems, difficulties in choosing food, and the solutions. Group members also shared experiences of the amount and how to consume fruits and vegetables for HD patients, as well as strategies for choosing foods to be consumed.
Session 4	Treatment management and hemodialysis adequation	Peer leaders asked members whether they had missed any HD schedules (skipping HD), and complaints that they experienced due to such absence. Group members also shared their past experiences of average time needed for completing an HD schedule, reasons for uncompleted HD (accelerated due to complications, e.g., cramps, hypotension). They also advised each other related to the drugs consumed, such as name, use, side effects, and how to meet the adequacy of hemodialysis (arriving on time, on time HD, and limiting weight gain).
Session 5	Emotional management	Peer leaders asked group members whether they often felt angry easily, and things they usually did to express the emotion. Exploration of solutions and tips for managing stress and anger, as well as practicing deep breathing relaxation with group members were also conducted.
Session 6	Evaluation and follow-up plan	Peer leaders and members explored feelings during the activity, advised each other, and determined the sustainability plan of the groups that had been established.

Data analyses

Data on the characteristics of participants such as gender, age, education, occupation, family income, the period of dialysis, and co-morbidities were analyzed using descriptive statistics. The homogeneity of the two groups was tested using the Chi-square test. The data normality on self-management was examined using the Shapiro Wilk test, and the result showed that the data were normally distributed. The paired t-test was used to analyze the mean difference before and after the intervention, while the independent t-test was used to compare the mean differences between the intervention and the control groups in this study.

Ethical considerations

This study was approved by the Health Research Ethics Committee of Tugurejo Hospital Semarang with number 57/KEPK.EC/IV/2019. Informed consent was obtained from all patients. Important information related to the purpose of the study, procedures, risk, and benefits of the study were explained to the patients. The confidentiality of the patients was also maintained throughout the study.

RESULTS

Characteristics of participants

The characteristics of participants in the intervention group and the control groups in this study showed a p-value of >0.05, indicating no statistically significant difference between the two groups. Table 2 shows that the majority of the participants in both groups were males (66.2%), late adults (41-65 years old) (78.5%), graduated from high school (50.8%), unemployed (60%), family income/month <IDR 2,500,000 (58.5%), period of dialysis <1 year (40%), and had 1 co-morbid disease (53.8%).

Table 2. Characteristics of participants in the control and the intervention groups (n=65)

Variable	Groups				*p*
	Control Group (*n*=33)		Intervention Group (*n*=32)		
	f	%	*f*	%	
Gender					
Male	21	63.6	22	68.8	0.862*
Female	12	36.4	10	31.3	
Age					
Early Adult (18-40 years old)	8	24.2	6	18.8	0.813*
Late Adult (41-65 years old)	25	75.8	26	81.3	
Education					
Elementary School	10	30.3	9	28.1	
Junior High School	7	21.2	6	18.8	0.930*
High School	16	48.5	17	53.1	
Occupation					
Employed	14	42.4	12	37.5	0.879*
Unemployed	19	57.6	20	62.5	
Family Income/Month					
< IDR 2,500,000	18	54.5	20	62.5	0.690*
≥ IDR 2,500,000	15	45.5	12	37.5	
Period of Dialysis					
<1 year	12	36.4	14	43.8	
1-3 years	12	36.4	13	40.6	0.516*
> 3 years	9	27.3	5	15.6	
Co-morbidities					
No co-morbid disease	8	24.2	8	25.0	
1 Co-morbid disease	17	51.5	18	56.3	0.861*
> 1 Co-morbid disease	8	24.2	6	18.8	

*Chi-square test

Effects of Peer Support Program on Self-Management of ESRD Patients

Table 3 shows that after the peer support program, the mean score of self-management in the intervention group increased from 79.47±7.919 to 90.75±7.089, while in the control group, the mean increased from 81.88±8.291 to 82.12±7.692 with a p-value of <0.001. It can be concluded that there was a positive effect of peer support programs on increasing self-management in ESRD patients undergoing hemodialysis.

Table 3. Effects of peer support program on self-management before and after the intervention

Group	Before Intervention	After Intervention	95% CI	P^a
	Mean±SD	Mean±SD		
Intervention Group	79.47±7.919	90.75±7.089	(-14.021) - (-8.541)	<0.001
Control Group	81.88±8.291	82.12±7.692	(-2.104) - (-1.619)	0.793
P^b	0.235	<0.001		

[a]Paired-sample t-test, [b]Independent-sample t-test.

DISCUSSION

This study investigated the effects of peer support programs on improving self-management in patients with ESRD undergoing HD. Results showed positive effects of peer support programs on increasing self-management of ESRD patients undergoing hemodialysis (p<0.001). These findings are similar to a study previous that peer support with group discussions improved self-management (p<0.001) (Mahjubian et al., 2018). Another study also showed that one-to-one peer support (peer mentoring) affected dialysis self-management (Russell et al., 2017).

The success of HD cannot work if it only relies on a health team. The ability of patients' self-management to lifestyle changes such as consistent attendance at a dialysis unit for treatment, restriction of fluid intake, diet, and taking medications, influence the success of HD therapy (Li et al., 2014). Patients will be involved in self-management behaviors that are recommended if they have information and trust in health, self-regulation abilities and if they have social facilitation that positively influences and supports them to engage in preventive health behaviors. So that giving education to patients to improve their ability to control themselves also needs to involve social support in the form of information, emotional and instrumental support (Ryan, 2009; Ryan & Sawin, 2009).

Knowledge, self-efficacy, and social support are factors that influence self-management in HD patients (Gela & Mengistu, 2018; Li et al., 2014). Previous studies show that peer support in group discussion was an effective educational method to promote knowledge that improves the self-management of chronic HD patients (Mahjubian et al., 2018). Sufficient knowledge about the disease and problem-solving abilities are very important in the process of identifying problems, choosing the right solution, and evaluating its effects (Ryan, 2009). Knowledge is considered to foster the ability of self-confidence, self-efficacy, and patient compliance, especially in making decisions to carry out self-management (Hibbard & Gilburt, 2014).

Self-efficacy in HD patients is formed from a person's confidence in applying behavior and increasing efforts to solve problems faced to maintain these behaviors (Ryan, 2009). Self-efficacy is interpreted as a condition of personal self-confidence that can understand the way of one's thinking and motivation for active behavioral change when faced with obstacles or barriers (Williams & Rhodes, 2016). Previous studies show that self-efficacy has been associated with self-management behaviors in chronic disease patients (Yao et al., 2019). To improve self-management behaviors, multiple strategies should be

conducted to improve patients' self-efficacy. Social support is an important aspect to enhance self-efficacy, and previous studies have shown that a person's self-efficacy has a positive correlation with the social support they receive; that is, the more social support a person receives, the higher their self-efficacy is (Wang, Qu, & Xu, 2015).

Social support has become an influencing factor in chronic disease patients' participation in health behavior (Pamungkas, Chinnawong, & Kritpracha, 2015). Most HD patients do not work and spend a lot of time undergoing treatment, and social support becomes a very important requirement (Kusuma, Ropyanto, Widyaningsih, & Sujianto, 2018). Patients who have better support tend to have a more positive state of mind in making better use of available resources to solve the problems they face (Li et al., 2014). Peer support happens when people who have similar experiences of something difficult come together to support each other (Side by Side Research Consortium, 2017). Peer support programs are carried out by sharing the experiences for improving HD self-management skills through informational support, emotional support, and mutual reciprocity (Husain, Kusuma, & Johan, 2018; Taylor et al., 2016). Patients who are members of a group exchange experiences about various problems faced and also share about how to overcome these problems. This activity makes each patient feel they have the same problem, need each other, and can give support to each other (National Kidney Foundation, 2009). Patients may help each other in ways that health care providers may not be able to by sharing lived experiences and support (Russell et al., 2017). In this study, peer support program was conducted for six meetings, two times a week for 30-45 minutes each meeting to solve the problems together about fluid restriction management, nutrition and treatment management, and emotional management. Furthermore, the patients also had the opportunity to share their experiences with other patients, assessed problem solving, anticipated obstacles, and maintained new behaviors during the program. Such factors promoted problem-solving, anticipation of obstacles, and maintenance of new behaviors (Pamungkas et al., 2015). These methods made patients more confident in their abilities in order to deal with their conditions.

This study has limitations, researchers did not distinguish between self-management measurement between peer leaders and their members, because the selection of peer leaders was based on mutual agreement between group members. Some patients who have good self-management, are unable or unwilling to become peer leaders to lead the discussion. Thus, researchers as facilitators motivated patients who already had good self-management to talk about self-management.

CONCLUSION

This study showed that peer support programs affected the increased self-management in patients with ESRD undergoing hemodialysis. Peer support programs should be introduced early to patients undergoing hemodialysis so that they can learn about self-management from other patients. Patients may help each other in ways that health care providers may not be able to by sharing lived experiences and support. Further research can be conducted by involving a larger number of samples, providing communication training for peer leaders, and adding outcomes objectively to laboratory results.

ACKNOWLEDGMENT
We sincerely thank the nurses and patients who participated in this study.

CONFLICT OF INTEREST
The authors declare no conflict of interest, financial or otherwise.

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