

The self-management program for fluid overload patients undergoing hemodialysis in Indonesia

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โปรแกรมการจัดการตนเองสำหรับผู้ป่วยของหลอดเลือดที่ได้รับการฟอกไตในอินโดนีเซีย*

อัปเรเลีย อาฟิคาตุล ฮานาฟี** นงลักษณ์ เมธากาญจนศักดิ์ ปร.ค. (พยาบาล)*** เวิร์จแอนติ นูร์
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บทคัดย่อ

ปริมาณของเหลวในผู้ป่วยที่ได้รับการฟอกไตเป็นสิ่งสำคัญ อย่างไรก็ตาม อัตราการปฏิบัติตามพฤติกรรมเหล่านี้ยังคงไม่ได้รับการศึกษานี้ดำเนินการเพื่อประเมินผลของโปรแกรมการจัดการตนเองในผู้ป่วยที่มีปริมาณของเหลวมากเกินไปโดยใช้การทดลองที่ทดลองกับการออกแบกกลุ่มควบคุมในผู้ป่วยที่ได้รับการฟอกไตที่โรงพยาบาล มุฮัมมาดิยะห์ ลามอนกัน ประเทศอินโดนีเซีย ผู้ป่วยทั้งหมด 40 รายเข้าร่วมในการศึกษานี้ ผู้ป่วยที่มีของเหลวไม่เกาะติดกันตามที่กำหนดโดยการเพิ่มของน้ำหนักระหว่างการล้างไต > 3% ของน้ำหนักแห้งในช่วง 4 สัปดาห์ อายุ >18 ปี สามารถอ่าน เขียน และพูดภาษาชาวอินโดนีเซียหรือชาวได้โดยไม่มีควมบกพร่องทางสติปัญญาอย่างรุนแรง รับประทานยาโดยสุญญ์ - การฟอกเลือดด้วยเครื่องไตเทียมเป็นเวลา >3 เดือน ได้รับการระบุและให้โปรแกรมการจัดการตนเองเป็นระยะเวลา 5 สัปดาห์ เวชระเบียนถูกใช้เพื่อระบุผู้ป่วยที่มีสิทธิ์ โปรแกรมการจัดการตนเองส่งผลให้ผลลัพธ์ทางคลินิกมีความแตกต่างกันอย่างมีนัยสำคัญ ได้แก่ การเพิ่มน้ำหนักทางหลอดเลือด (IDWG) (p=.002) ระหว่างกลุ่มทดลองและกลุ่มควบคุม โปรแกรมการจัดการตนเองใช้แบบจำลองที่มีประสิทธิภาพและใช้ได้จริงสำหรับการปรับปรุงเครื่องหมายทางคลินิก (IDWG) และสามารถลดภาวะแทรกซ้อนที่เกี่ยวข้องกับโรคไตระยะสุดท้ายได้อย่างมีนัยสำคัญ ด้วยความเป็นไปได้ของโปรแกรมประเภทนี้ จึงมีศักยภาพสูงในการเสริมการดูแลที่ได้มาตรฐาน.

คำสำคัญ: การจัดการตนเอง; การฟอกไต; การเพิ่มของน้ำหนักทางหลอดเลือด ของหลอดเลือด

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The self-management program for fluid overload patients undergoing hemodialysis in Indonesia*

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Abstract

Fluid intake among patients undergoing hemodialysis is essential, however, adherence rates to these behaviors are still poor. This study was conducted to evaluate the effect of a self-management program on patients with excess fluid volume using a quasi-experimental with control group design among patient undergoing hemodialysis at Muhammadiyah Lamongan Hospital, Indonesia. A total of 40 patients were enrolled in this study. Patients with fluid non-adherent as defined by an interdialytic weight gain > 3% of the dry weight over 4 weeks, age >18 years, be able to read, write and speak in Indonesian or Javanese language without severe cognitive impairment, treated with center-based hemodialysis for >3 months, were identified and given self-management program for 5 weeks period. The medical records were used to identify eligible patients. The self-management program resulted that there are significant differences in the clinical outcomes: Intradialytic Weight Gain (IDWG) ($p=.002$), between the experimental group and control groups. The self-management program provides an effective and practical model for improving the clinical markers (IDWG) and could significantly reduce end-stage renal disease-related complications. Given the feasibility of this kind of program, it has strong potential for supplementing standard care.

Keywords: Self-management; Hemodialysis; Intradialytic weight gain; fluid overload

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Introduction

Patients' adherence to recommended treatment regimens determines the quality of healthcare outcomes¹. However, non-adherence to dialysis therapy, on the other hand, has been recorded at rates ranging from 8.5 percent to 22.1 percent over the world². Moreover, despite the fact that fluid adherence is a critical component of dialysis adequacy in hemodialysis patients³. The prevalence of non-adherence of fluid management still become the most common problem and a major challenge for hemodialysis patients, According to reports, 30 to 60 percent of hemodialysis patients do not follow fluid consumption guidelines⁴. Non-adherence in hemodialysis patients has been shown to significantly increase the risks of hospitalization and mortality².

Patients with ESRD requiring renal replacement therapy (RRT), as well as a specific management approach for patients to change and maintain an appropriate diet, fluid intake, and medication behaviors to maximize good clinical outcomes⁽⁵⁾. And hemodialysis is reported to be the most common and effective treatment method as RRT⁵. Nevertheless, patients who undergoing hemodialysis are required to change some behavior and confront comprehensive management which is complex and difficult to perform. Moreover, in the United States, reported Intradialytic weight gain is common in 10–20 percent of hemodialysis patients (IDWG)⁷. IDWG has been linked to major side effects include high blood pressure, heart failure, and death^{8,9}. In addition, the removal of excess fluid during hemodialysis can cause various symptoms for the patient such as hypotension, muscle cramps, nausea, and headaches⁷. Therefore, it is very important to help patients overcome and change their fluid restriction behavior and to improve personal control through self-management strategies¹⁰.

In this context, there is growing evidence that behavioral intervention tactics like self-management programs with self-monitoring education, behavioral contracts, and positive reinforcement can enhance compliance¹¹. Similarly, the study from Midwest reported improvement of IDWG¹². However, not many intervention studies have examined targeted regimens among hemodialysis patients, Moreover, only a few health facilities provide empowerment or management programs applied theory-based to guide the intervention in helping the patient with ESRD undergoing hemodialysis to manage their condition¹³. T As a result, the goal of this study was to see how a self-management program affected intradialytic weight gain (IDWG) in patients with ESRD who were on hemodialysis.

Materials and Method

Study design and population

This study was conducted at the hemodialysis unit at Muhammadiyah hospital, Lamongan District, East Java, Indonesia, using a quasi-experimental design with two groups, pre-test, and post-test. The sample size in this study was calculated by using the effect size of the difference between two dependent means from the previous study conducted by

Brayant et al. (2016) which determined the power of the test at 0.80 and a significance level of 0.05. A total of 40 patients were randomly assigned to the experimental and control groups. The inclusion criteria were Patients with fluid non-adherent as defined by an interdialytic weight gain > 3% of the dry weight over 4 weeks, age >18 years, be able to read, write and speak in Indonesian or Javanese language without severe cognitive impairment, treated with center-based hemodialysis for >3 months. The experimental group received the self-management curriculum for 5 weeks, whereas the control group received normal hemodialysis unit nurse care. This study enrolled patients who met the inclusion criteria; suitable participants were found through medical records. Over the course of 5 weeks, participants' IDWGs were recorded.

Instruments

The research instruments used in this study was self-management booklet which was used in the self-management program. The program included 5 weeks (educational part and self-practice part) for 30 minutes each. A self-management program was adjusted based on Kanfer self-management model. The program was focused on fluid management for hemodialysis patients. the researcher asked the 5 experts in the concept of self-management of a patient with ESRD undergoing hemodialysis from teachers from the Faculty of Nursing, Khon Kaen University, a teacher from the Muhammadiyah Lamongan University, the hemodialysis nurse from hemodialysis unit Muhammadiyah Lamongan hospital, and an advance practice nurse in the hemodialysis unit Srinagarind hospital for validating the contents of intervention instrument as well as seeking the suggestions and opinion in the study. The result of the content validity index (CVI) showed 0.96 and was considered acceptable. Second, the face validity was confirmed with the two Indonesian nurses who are working in the hemodialysis unit, and three Indonesian patients with ESRD undergoing hemodialysis were asked to review, identified, and ensure the level of Indonesian language literacy of the self-management program.

Program

The self-management program for patients with ESRD undergoing hemodialysis was developed by the researcher based on the self-management model proposed by Kanfer and Gaelick-Buy (1991). Which the program contents covered both knowledge and skill practice, or behavior of the patients consists of two parts: a). Educational Package were discussed a brief review of how and why self-management is important, review of self-management process (self-monitoring, self-evaluation, and self-reinforcement) and the overview about hemodialysis treatment and fluid management that was delivered through educational class and group discussion using PowerPoint. b). Self-management skill practice package in terms of a book record and consultation, designed to assist the active participation of the patients on self-management skills through monitoring their fluid intake, Consists of three stages: self-monitoring, self-evaluation, and self-reinforcement.

Outcome measurement

The intradialytic weight gain (IDWG) described as weight gained between hemodialysis sessions. The patient's body weight was weighed routinely before and after hemodialysis. IDWG was calculated as the patient's pre-dialysis weight (I), minus the post-dialysis weight of the previous hemodialysis session (II) and then the difference between the measurement II minus measurement I divided by measurement II multiplied by 100%, and then the average of each IDWG measurement over 1 month were assessed as IDWG absolute (Dantas et al., 2019).

Statistical Analysis

The data was analyzed using SPSS for Windows, with a 0.05 probability level applied throughout. To compare the intervention and control groups, Chi-squared and t-tests were used.

Ethics

The study was approved by the Ethics Committee of Khon Kaen University Thailand, no: HE632266 approved on 24 December 2020 and the Ethics Committee of Muhammadiyah Lamongan University No: 062/EC/KEPK-S1/02/2021 approved on 4 February 2021. Informed consent was obtained from all participants. Important information regarding the research objectives, procedures, risks and benefits of the study is explained to participants and patient confidentiality is maintained throughout the study.

RESULT

A total of 40 hemodialysis patients at the Muhammadiyah hospital were assessed for eligibility. The largest percentage of the subjects in the experimental group were female (60 %) with had an average age of 43.25 years (SD = 10.25). Most of the participants (45%) had secondary school-level education. The duration of hemodialysis for more than half of the participants was 1-5 years (70%) with an average of 4.65 years (SD= 3.08) and most of the patients had hypertension as the comorbidity's disease (75%). Compared to the control group at baseline, the experimental group had no significantly different patient characteristics (Table 1).

Table 1 Frequency and percentage of participants' characteristics

Variable	Control Group		Intervention Group		P-value
	(n=20)		(n=20)		
	F	%	f	%	
Sex					.50

Male	6	30.00	8	40.00	
Female	14	70.00	12	60.00	
Age (Year)					.38
< 40	8	40.00	4	20.00	
41 – 50	7	35.00	9	45.00	
> 51	5	25.00	7	35.00	
$\bar{X} \pm SD$		48.95 ± 9.53		43.25 ± 10.25	
Level of Education					.56
Primary School	8	40.00	5	25.00	
Secondary School	8	40.00	9	45.00	
Bachelor's/ Master's degree	4	20.00	6	30.00	
Duration of Hemodialysis (Year)					.81
1 - 5	14	70.00	14	70.00	
> 6	6	30.00	6	30.00	
$\bar{X} \pm SD$		4.00 ± 1.94		4.65±3.08	
The Presence of other chronic diseases					.31
Hypertension	15	70.00	12	75.00	
Others	5	30.00	8	25.00	

Analysis of IDWG

The rate of fluid adherence represents the percentage of hemodialysis treatments in which the IDWG was not more than 3% of the patient's dry weight. The pre-and post- IDWG of the group were collected and recorded. A paired samples *t*-test was computed for the difference in the mean IDWG of the participants. After 5 weeks participating in the self-management program, the fluid management knowledge of the patients was significantly

decrease in the experimental group ($M=2.67$, $SD=1.28$), and the control group ($M=2.67$, $SD=1.28$), ($t=6.28$, $p<0.00$). These data are shown in Table 2

Table 2 Mean and SD score of IDWG, and behavior between the control and intervention groups in post-test.

Variable	Control (n=20)		Intervention (n=20)		Mean Difference (95 % CI)	t	p-value
	\bar{X}	SD	\bar{X}	SD			
IDWG	3.91	1.05	2.67	1.28	1.23(0.48 – 1.98)	3.332	.002

Discussion

The current study reports the effectiveness of a self-management program for hemodialysis patients in managing their fluid intake compared to the standard care. The findings of this study showed that there was improvement of the IDWG of the participants after following the self-management program, this result was in line with previous work reported the improvement of the IDWG in the intervention group after following the self-management program^{4,5,12}. This result of the study also indicated that is possible to promote the self-management program for patients with excess fluid volume undergoing hemodialysis in Indonesia.

The self-management program in this study has a positive effect on intradialytic weight gain. The self-management program consisted of an educational package as well as the skill practice package including the self-monitoring, self-evaluation, and self-reinforcement that played an important role in encouraging the adherence of patients with ESRD undergoing HD regarding fluid restriction management. In this study, the self-management program was able to support effective goal achievement in a variety of ways. First, using self-monitoring as a tool to encourage participants to consciously monitor their fluid intake raised their awareness of their actual behaviors. The second stage is self-evaluation, in which participants were assisted and encouraged to assess whether their current fluid intake behavior met the desired fluid intake criteria, as well as to identify the fluid intake behavior that needed to be improved, maintained, or changed. Furthermore, is the self-reinforcement in this part the participants were assisted in deciding whether they wanted to maintain, modify, or improve their fluid intake behavior through self-reinforcement activities. As a result, the subjects were forced to recognize and comprehend the activities that needed to be carried out to improve their fluid intake behavior. Furthermore, the self-management program views participants as the key to the program because they know what is best for their own lives. As a result, they were able to

make their own decisions about goal selection and action plans to achieve the desired behavior. It was discovered that when subjects were actively involved in the self-management program, they demonstrated competence to change their behaviors and a high likelihood of success¹⁴. These studies back up and demonstrate the effectiveness of using SM to encourage chronically ill patients to change their behaviors to manage the negative effects of chronic disease.

Another method that contributed to the study's favorable outcome was setting individual goals and action plans to attain the desired behavior. The goal establishing and action planning session, according to Bodenheimer and Handle (2009), encouraged each subject to voluntarily engage in the process of changing their habits by adopting their own goals and action plans. The goals and action plan also gave the subjects clear direction on what activities they should do and how they should attain their objectives. The weekly follow-up and counseling gave the subjects regular encouragement, allowing them to enhance their knowledge, responsibility, skill, and attitude, and motivation to achieve their goals. The self-management support program has evolved into a vital component of the care model for encouraging patients to participate and engage actively in their treatment¹⁵. This is important to change patient behaviors.

Another study also using the same strategy including monitoring skill regarding their fluid intake behavior resulting in an improvement of IDWG¹². Furthermore, the researcher assisted the patients in evaluating achievement, assessing difficulty, and setting realistic goals based on the patient's condition and these become significant factors in behavior change. In other words, patients were taught how to create an action plan to change their lifestyle, monitor, record, and interpret their fluid intake behavior. Moreover, during this program, the patients had the opportunity to assess problem-solving skills, anticipate obstacles, and maintain new behaviors. These factors aided in problem-solving, anticipating obstacles, and maintaining new behaviors. Patients gained confidence in their abilities to manage their conditions as a result of these methods.

However, this study found that IDWG significantly improves after participating in the program. The improvement in the IDWG could be due to several factors: First, the strategy that contributed to the reduction of IDWG was the weekly follow-up and counseling. This stage also provided regular encouragement to the participants, allowing them to continuously improve their knowledge, responsibility, skill, and motivation to achieve their goals. This strategy was used to give patients good or negative feedback on their efforts, as well as the ability to re-formulate the intermediate goal. Because the patient actively participated in the process of reduced fluid intake, this approach is one of the intervention's key strengths. Although the result of IDWG was significantly decreasing in the intervention group, implying that the observed effects are clinically relevant the magnitude of effects in this study may be small. Therefore, relapse can be occurred. The study from Griva et al., 2017 also reported that the IDWG decrease in the early weeks but increased from the third week to the fourth week, However, it remained significantly lower than the baseline, indicating that the effects remained. Evidence suggests that fluid intake

therapies that included a combination of self-management components (monitoring, goal setting, reinforcement/feedback) were successful in reducing interdialytic weight gain (IDWG) in HD patients^{4,11}. The finding of the study is consistent with previous self-management research^{5,16}. As a result, to control the inter-dialytic weight gain, it is necessary to provide self-management programs that reflect the various attributes associated with self-management.

In conclusion, our study demonstrates significant improvement in clinical parameters IDWG by self-management program. The study focuses on fluid restriction in patients with ESRD undergoing HD, therefore, the contents that provided to the patients more specific and only highlighted on the important information related to fluid restriction management. Second this study using the combination of interventions including cognitive, and behavioral interventions to provide the basic knowledge and improve the skill of the patients regarding their management on fluid restriction. However, the self-management program was conducted 5 weeks and there is no follow-up session were available after the program therefore, the relapse might be occurred. Second, this study was conducted only on small size of population, therefore, to generalization of the result the study should have involved more participants. Perhaps further improvement can be achieved if patient's family members are motivated to actively support the self-management the program.

Implication

This study finding suggests that nurses should take the self-management program to encourage for discharge plan to the patients with ESRD undergoing hemodialysis for providing better knowledge of fluid management and to assist the patients in managing their fluid intake and make the patients more confident to take care of themselves about fluid intake management, which are the indicators for control the fluid status and IDWG and protection from complications. Moreover, the self-management program can develop the nurse competency to assess the patient, provide knowledge, and stimulate the patient's self-management behavior.

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