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**CASE STUDY**

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**Case Study: Awarding Education of Fluids Restriction Management on Impaired Kidney Perfusion for Improving Self-Efficacy of Patients and Families**

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**Abstract**

Non-adherence to fluid restriction on impaired kidney perfusion problems will lead to chronic excess fluid and increase the risk of other disease complications. Self-efficacy is an important component of achieving goals. Fluids restriction management education in the impaired kidney perfusion problems is the main thing that required to improving self-efficacy of patients and families. The purpose of this case study is to examine self-efficacy of patients with impaired kidney perfusion before and after fluids restriction management education in patients and families. Cases study was performed on two patients with impaired kidney perfusion. Fluid restriction management education on patients and families are given to improve self-efficacy. Self-efficacy scores on Mr. Y before the education are 105 and 112 after education, while the self-efficacy scores on Mr. E before the education are 111 and 113 after education. Furthermore, both patients stated to be more assured on adherence to fluid restriction management for impaired kidney perfusion. Education of fluid restriction management in patients and families with impaired kidney perfusion can improve self-efficacy in patients. Nurses can educate the patients and families by multiplying methods and instructional media.

**Keywords:** education, family, fluid restriction management, impaired kidney perfusion, self-efficacy

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**1. Introduction**

Kidney is a vital organ, which has a very important role in maintaining the stability of body functions including maintaining the volume and composition of the extracellular fluid within normal limits (1). Rapid kidney blood flow exceeds the oxygen and kidney metabolic needs, but it's necessary because it facilitates metabolic excretion.

Consequently, impaired perfusion of kidney tissues can affect the formation of urine and the survival of cells that function to maintain the internal balance of the body (2).

Impaired kidney perfusion is a digression of blood circulation to the kidney, which may harm the healthiness (3). This impaired can described the condition of the vascular system. The impact of vascularity in the entire kidney tissues is capable of decreasing the Glomerulus Filtration Rate (GFR), which will result in sodium and fluid retention causing problems of excess fluid volume (4)

Previous study showed that 33-50% patients with impaired kidney perfusion do not adhere to fluid restriction, resulting in excess fluid volume problems. This can undermine the effectiveness of therapy and lead to unexpected disease progressivity as well as possibly increase the occurrence of complications. Hence, it requires adherence to fluid intake in this population (5).

Adherence means the patient should take time in undergoing necessary treatment such as in diet and fluid setting impaired kidney perfusion problems (6). Several studies reported factors that affect adherence to patients are knowledge, social support, and self-efficacy (5).

Self-efficacy is one's assurance of success in doing self-care to achieve a desired outcome. A person with increased perception in self-care activities will more easily participate in self-care activities thereby increasing adherence to therapeutic regimens (7).

Self-efficacy acts as a mediator between changes in quality of life. Self- efficacy will increase if the patient is empowered by motivating and explaining the disease and how to handle the disease, so that the quality of life will also increase (8). According to Bandura (1994) (7), education is one source of self-efficacy in the form of verbal persuasion. When a person gets an outside suggestion that he or she is capable of doing something, then they will be more capable to survive when in trouble.

It also requires family support. Friedman (2013) (9) stated that family support is an effort given to others, both morally and materially to motivate the person in carrying out the activities. Study was conducted by Firmansyah (2016) (10) discovered that there was a relationship between knowledge, attitude, family support with non-adherence to dietary with patients with impaired kidney perfusion problems. Family support is the most influencing factor of adherence to dietary.

Based on the results of the assessment on two patients with impaired kidney perfusion problems in the working area of a public health center in Semarang, it was found that all patients stated that they had not adhere the fluid restriction programmed to them. They often violated the amount of fluid intake that is actually restricted. This is due mainly to thirst. A patient has never tried to completely comply with the fluid restriction because the lack of knowledge related to fluid management that should be done, so that his wife also wasn't able to help limiting and keeping fluid intake, whereas one other patient has never tried to completely complied with fluid restriction was because sometimes didn't feel assured to do it due to work and wife who hesitated to remind in the case of fluid restriction management. When they drank too much, they

often complained that their body felt heavy and shortness of breath.

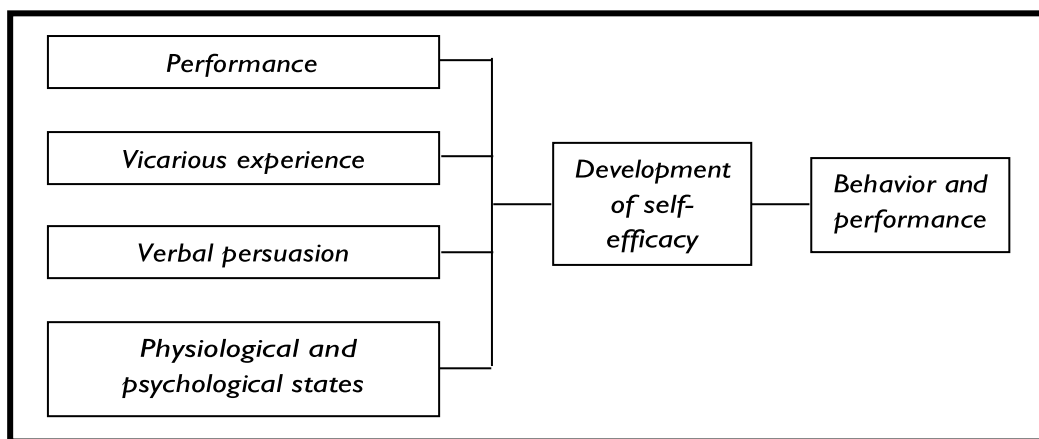
The phenomenon of non-adherence to fluid intake restriction on patients with impaired kidney perfusion problems will lead to chronic excess fluid and increase the risk of other disease complications. Self-efficacy is an important component of achieving goals. Therefore, fluids restriction management education in the impaired kidney perfusion problems is the main thing that required to improving self-efficacy of patients and families.

## 2. Objective

To examined the self-efficacy of patients with impaired kidney perfusion problems before and after education of fluids restriction management.

## 3. Theoretical Framework

Self-efficacy theory applied to this case study refers to Albert Bandura's self-efficacy theory in 1994 (7). The sources of self-efficacy consist of performance accomplishment, vicarious experience, verbal persuasion, and physiological and psychological states. These four sources can affect the development of self- efficacy, which will impact the behavior and performance.



**Figure 1.** Sources of self-efficacy (Bandura, 1994)

## 4. Methods

Design used in this study is a case study. Characteristics of respondents in this case study are patients with impaired kidney perfusion problems as much as 2 people in a public health center in Semarang.

Education provided in the form of programmed health education using Microsoft power point media on notebook with the duration for 60 minutes, accompanied by material that contains the concept of fluid restriction management on impaired kidney perfusion problems. Media features clearer images and illustrations. In addition, respondents were also given a leaflet containing information about the concept of chronic

kidney disease, hemodialysis, nutritional management, fluid restriction, and stress management.

Self-efficacy was measured using self-efficacy questionnaires in patients with chronic kidney disease that contained 32 self-efficacy statements with an assessment of the answer using a Likert scale of 1-5 (1: not sure to 5: very sure). The total value obtained by adding the value of each statement item, so the range of values obtained is 32-160. The higher the total value, the better the patient's self-efficacy (11). The pre-test questionnaire was completed 3 days before the education and for the post-test questionnaire was completed the day after the education was done.

Ethical considerations of this case study used are autonomy, anonymity, confidentiality, beneficence, and non-maleficence.

## 5. Results

**Case 1.** Mr Y (32 years old) is male with high school education and work, diagnosed impaired kidney perfusion problems since April 2018 with incidental hemodialysis schedule, smoker and alcoholic history during 10 years, but there is had no history of hypertension and diabetes mellitus diseases. The patient said that he did not understand about kidney disease and its management. Patient had several times escaped from check-up because of bored so that his body felt heavy and shortness of breath, then he should have hemodialysis for the second time. Moreover, he had never undergone dietary and fluids-intake restriction during the kidney disease because he did not know the details for its management. The patient's wife said that she did not understand the self-care of kidney disease patients, especially on dietary and fluids-intake restriction, so that he could not help to limiting and keeping the fluids-intake in her husband.

Patient and family were provided a fluids restriction management education intervention for 1x60 minutes. They were given an explanation about the concepts of chronic kidney disease, hemodialysis, nutritional management, fluids restriction, and stress management using leaflets. In the session of fluids restriction materials, patient and family were described using Microsoft power point and leaflets media, then they were involved to calculated about fluid restrictions per day on the patient and made its plans. Patient said he was assured of herself could do the recommended fluid restrictions. In addition, the patient's wife said she was ready to help her husband to make fluids restrictions as instructed. Total score of self-efficacy on patient before the education was 105 and after education was 112, so it can be concluded that by giving a brief education impact on a slightly better improvement of patient's self-efficacy. Score on the magnitude dimension before education was 36 decreased to 35 after education, score on the generality dimension before education was 37 increased to 40 after education, and score on the strength dimension before education was 32 raised to 37 after the education.

**Case 2.** Mr. E (37 years old) was male with high school education and work, diagnosed impaired kidney perfusion problems in 2012 with

regular hemodialysis schedule every 2 times a week and had a hypertension disease history but had no history of diabetes mellitus disease. Patient said that he already understands about the treatment of kidney patients, but still ate and drank carelessly. He was not sure that he would be able to diet especially fluids restriction because it must work, so her Intradialytic Weight Gain (IDWG) is always above 2 kg. In addition, the patient's wife said that she actually wanted to remind her husband of dietary and fluids-intake restriction but she was reluctant to reprimand. Patient's wife sometimes still liked to cook what the husband should challenge so that her husband ate what she cooked.

Patient and family were provided a fluids restriction management education intervention for 1x60 minutes. They were given an explanation about the concepts of chronic kidney disease, hemodialysis, nutritional management, fluids restriction, and stress management using leaflets. In the session of fluids restriction materials, patient and family were described using Microsoft power point and leaflets media, then they were involved to calculated about fluid restrictions per day on the patient and make its plans. Patient said he can reassured itself to be able to do fluids restrictions that had been recommended but not done because of lack of assured and will be ready to accept when the wife rebukes. In addition, the patient's wife said that she would be ready to admonish or remind him about fluids restriction on her husband without hesitation and help to do what they had planned together about fluids restrictions. Total score of self-efficacy on patient before the education was 111 and after education was 113, so it can be concluded that by giving a brief education impact on a slightly better improvement of patient's self-efficacy. Score on the magnitude dimension before education was 38 raised to 40 after education, score on the generality dimension before education was 38 became to 38 after education, and score on the strength dimension before education was 35 decreased to 34 after the education.

## 6. Discussions

In the case 1, Mr Y (32 years old) is male with high school education and work, diagnosed impaired kidney perfusion problems since April 2018 with incidental hemodialysis schedule, smoker and alcoholic history during 10 years, but there is no history of hypertension and diabetes mellitus diseases. Total score of self-efficacy on patient before the education was 105 and after education was 112, so it can conclude that by giving a brief education impact on a slightly better improvement of patient's self-efficacy.

Patients with a history of smoking have a risk 2 times greater the incidence of chronic kidney disease than patients without smoking history. The acute phase smoking effects can increase the sympathetic race, which will result in increased blood pressure, tachycardia and accumulation of catecholamine in the circulation. In the acute phase some blood vessels also of ten experience

vasoconstriction in coronary arteries, so in acute smokers often followed by increased blood vessel resistance so that there is a decrease in glomerular filtration rate and filter fractions.

In addition, if alcohol is consumed, it has toxic effects on the body either directly or indirectly. One consequence of excessive alcohol consumption (ethanol) is the increased risk of kidney disease and liver function diseases. Consuming ethanol is very dangerous because the chemical reactions of these compounds form a strong nephron toxic to cause impaired function and cell death (necrosis) in proximal tubular cells (12).

In the case 2, Mr. E (37 years old) is male with high school education and work, diagnosed impaired kidney perfusion problems in 2012 with regular hemodialysis schedule every 2 times a week and had a hypertension disease history but had no history of diabetes mellitus disease. Total score of self-efficacy on patient before the education was 111 and after education was 113, so it can be concluded that by giving a brief education impact on a slightly better improvement of patient's self-efficacy.

Clinically, patients with a history of hypertensive disease had a chronic renal failure risk of 3.2 times greater than patients without a history of hypertensive disease (13). Hypertension can aggravate kidney damage through increased intra glomerular pressure that causes structural disturbance and functional impairment of the glomerulus. High intravascular pressure is passed through the afferent arteries into the glomerulus, where the afferent arteries are constricted by hypertension (14). In addition, hypertension will lead to increased heart activity and damage to the kidney blood vessels. Damage to the kidney vessels results in impaired filtration and increases the severity of hypertension (15).

The results of this case study are in line with study of Tsay (2003) (16), which provided material about pathophysiology of kidney disease, hemodialysis, medication, complications, nutrition, fluid restriction, controlling thirst, and stress management on his education for 1 hour per session was obtained a controlled results average weight gain of patients. In addition, the application of leaflet and educational media with lecture, question and answer, discussion, and family involvement methods influenced dietary and fluid-intake restriction adherence (17).

Another study conducted by Wahyunah et al. (2016) (18) reported that a 60- minute structured educational use of LCD and notebook media along with a leaflet containing Intradialytic Weight Gain (IDWG) controls and fluid restrictions could provide an improving self-efficacy and decreasing IDWG in patients. This education is included in the source of the efficacy of verbal persuasion. Information about the abilities conveyed verbally by an influential person is usually used to convince a person that he is capable enough to perform a task (7). Through this educational process the patient would know that chronic kidney disease would



lead to impact and various changes in the body. Non-adherence with fluids restriction might lead to chronic excess fluid and increased risk for cardiovascular and hypertensive (19). Adherence to therapeutic regimens and preventing or minimizing complications is important factors that contribute to survival and quality of life (5).

After the patient knows about chronic kidney disease and the various impacts that are caused including the impact if there is excess fluid then the patient will be formed motivation. A person's cognitive motivation motivates them and guides their anticipatory action through thinking into the future. They form assurance about what they can do, anticipate possible outcomes, set goals and action plans designed for a worthy future (11).

Several studies have mentioned factors that affect adherence to chronic kidney disease in maintaining IDWG, which is the level of knowledge, social support, and self-efficacy. Self-efficacy was one's assured in success in doing self-care to achieve the desired result (16). Self-efficacy theory was based on one's expectations with regard to a specific set of actions. The process of formation of efficacy was done through cognitive, motivational, and affective and selection processes throughout life. Cognitive function allowed individuals to predict the daily events that would result in the future. Individuals would foresee events and develop ways to control events that affect their lives. Most of the motivation resulting from the cognitive process as well as to achieve success requires assurance and optimistic (7).

Patient adherence with impaired kidney perfusion problems against fluid restriction may fluctuate and to maintain it one of them with social support. Social support can improve the ability of individuals to obtain new information and help in solving problems. Study of Firmansyah (2016) (10) resulted in the finding that there was a correlation between knowledge, attitude, and family support among patients with non-adherence with impaired kidney perfusion problems. Family support is the most influencing factor of adherence to dietary. Social support can minimize the negative effects of stressors such as depression of solitude, disease burden and acceptance of disease. Social support, one of which can be obtained from family at home and staff in the hemodialysis unit such as nurses because patients interact every dialysis session. Nurses and families can always remind patients to always adhere to fluid intakes.

This case study shows an increase in self-efficacy scores on both patients after education. However, there is a difference in self-efficacy score increase. On Mr. Y, self-efficacy score after education has more difference than difference of self-efficacy score at Mr. E. This may be due to differences in length of periods of illness or hemodialysis. According to Hadi (2015)(20), the longer undergoing hemodialysis, the adherence of fluid restriction is lower and vice versa, the more recent undergoing hemodialysis then the higher adherence to fluid-intake restriction.

Self-efficacy consists of 3 dimensions such as magnitude, strength, and generality. In the magnitude dimension, the score of Mr. E has increased from 38 to 40 after education, while Mr. Y decreased from 36 to 35 after education. This dimension focuses on the difficulty level of each person will not be the same. These differences can occur due to age and experience differences in which Mr. E has an older age and has experience of longer-term kidney perfusion problems than Mr. Y. Therefore, Mr. Y is still in the process through the adaptation stage of the condition and health status due to suffering from kidney perfusion problems for <1 year showed the score on this domain decreased (21).

Self-efficacy is formed through a social learning process that can last for life. Older individuals tend to have more time-span and experience in overcoming something that happens, so as to better deal with obstacles than younger individuals (7). In addition study was conducted Sapri (2004) (22) stated that the duration of hemodialysis therapy had an influence on knowledge, attitude and adherence of fluids restriction. Each patient needs different times to improve his or her knowledge and attitude. The longer the patient undergoes hemodialysis therapy, it will be much knowledge gained and can be positive towards adherence fluid-intake restriction.

On the dimension of generality, score on Mr. Y increased from before education is 37 and after education is 40, while the score on Mr. E before and after education is the same that is 38. This dimension focuses on the expectation of mastery of experience of related business that has been done (7). Then, on the strength dimension, score on Mr. Y also increased from before the education as much as 32 to 37 after the provision of education, while the score on Mr. E has decreased from 35 before education to 34 after education. The dimension focused on the assurance in doing business. Weak of hopefulness could be caused by a bad experience. Hopefulness here plays a major role in decision action.

The results mentioned above showed that Mr. E who has a longer experience in living with problems with renal perfusion disorders and hemodialysis from Mr. Y has not found an increasing in scores on both the self-efficacy dimensions of generality and magnitude. In accordance with the results of previous studies, which stated that, the period of illness may affect adherence, where adherence to self-care measured as advise by medical personnel is mediated by self-efficacy (8). Some diseases are classified as chronic diseases, many have compliance problems. The long-term effects of illness not to mention complex life-style changes as well as the frequent complications that arise as long-term impact of illness affect not only the patient's physical, but also emotional, psychological, and social. In hemodialysis patients, the results of the study showed differences of adherence in illness period less than one year with more than one year. The longer the illness, the higher the risk of decreasing adherence (23).



## **7. Conclusions and Recommendations**

Education about fluids restriction management can be one of the most important interventions for patients and families with impaired kidney perfusion problems. This case study showed that education of fluids restriction management on patients and families with impaired kidney perfusion problems can have an effect on improving patient self-efficacy.

Health workers, especially nurses, can educate patients and families with impaired kidney perfusion problems by multiplying methods and learning media. Then, they require in increasing knowledge related to the concept of kidney disease and its management. Besides, public health center can provide facilities for the implementation of education related impaired kidney perfusion problems. Further study needs to be conducted in several methods such as experimental study to find the effectiveness of education and self-efficacy measurement by using other instruments more specific and has been standard.

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