

**ASSOCIATION BETWEEN ATTITUDES TO SELF MANAGEMENT ON
ADHERENCE IN RESTRICTION FLUID AND DIETARY AMONG PATIENT
HEMODIALYSIS RELATED TO HYPERVOLEMIA**

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ABSTRACT

This study aims to determine the relationship between hemodialysis patients' attitudes toward self-management and adherence to fluid restriction and hemodialysis diet related to hypervolemia. This research method is a Literature review. The data used in this study comes from reputable journal articles published nationally and internationally in national and international online journals. The results showed that the risk of hypervolemia was reduced when patients could manage their health by performing self-care, developing a self-management plan, and modifying initial diet and renal fluid instructions to adapt to their lifestyle. In conclusion, there is a relationship between self-management and compliance of hemodialysis patients with fluid and dietary restrictions, especially sodium.

Keywords: Compliance, Self Management, Fluid Restriction, and Diet

INTRODUCTION

Regardless of the fact that self-management is a critical component of hemodialysis treatment, many patients refuse to implement instructions for self-management because they necessarily require lifestyle changes and behavioral constraints. Individuals' adaptation to the disease is supported by self-management activities, which also include working to improve treatment adherence, disease control, quality of life, and self-perceived health status. Problem solving, managing everyday living according to medication regimens, and engaging in health promotion behaviors all are parts of end stage chronic kidney disease and self-management. However, due to the nature of the disease, its course, and the fact that end stage chronic kidney disease patients are frequently elderly and have numerous diseases, everyday self-management is difficult (Chen et al., 2018).

Non-adherence defined as a did miss and shortened treatments, have a connection with the failure to manage interdialytic weight gain and serum phosphorus levels, according to the National Kidney Foundation's. Pertaining to one meta-analysis, hemodialysis patients followed medication, treatment, diet, and liquid restriction requirements in 33.0 percent to 80.9 percent of the time. Dietary and fluid management guidelines were especially poorly followed, with 25–86% of participants finding it difficult to follow instructions (Oquendo et al., 2014). Patients non-adherence to treatment have a more above condition in mortality rate (Park & Kim, 2019). Self-management strategies are required convinced behavioral changes, fluid and

dietary plan will be the initial plan in patients end stage chronic kidney disease on hemodialysis to improve their treatment outcome.

However, Angraini & Putri (2016) stated that more than 15% of cases of overload caused death in patients undergoing hemodialysis. Complications of chronic kidney failure related to overload fluid which is can be prevented through effective and efficient restriction of fluid intake, effective and efficient fluid restriction in patients undergoing hemodialysis that is need to do self management. Assigning patients to take liability of the therapy plan by reassuring self-management has been delineated to develop outcomes. Patients' positive at time to manage and participate in their plan to achieve a healthy self care in order to optimize health are referred to as self-management that is managing complications and decreasing symptoms and minimizing the disease's staircase into their lifestyle are all kind of behaviors (Natashia et al., 2019).

Başer & Mollaoğlu (2019) analyze the affected factors due to decreased self-care durability to maintain and manage their self , commonly hemodialysis patients have difficulties performing activities in daily living especially in non-adherence to restriction in fluid and dietary intake . By several studies, 10.0 percent to 60.0 percent of hemodialysis patients do not restriction fluid and dietary initial goal from the MD. Similarity in a study conducted by Kara et al., (2019) the rates of non-adherence to diet and fluid restrictions were 68.1 percent in diet restriction and 58.1 percent in fluid restriction, respectively according the study research to hemodialysis patient . They discovered in some research that diet and fluid restriction in dialysis patients, 48.8 percent of the participants showed moderate non- adherence to diet and 34.7 percent demonstrated severe non-adherence to fluid restriction related to experienced leg edema an possibility lead to lung edema.

Noncompliance with dietary and fluid restrictions was defined marked as a serum phosphorus level of more than 7.5 mg/dl and a predialysis serum potassium level of more than 6.0 mEq/L, and also the big marked will be showed in interdialytic weight gain (IDWG) of more than 5.7 percent of body weight or in other definition is excess fluid volume, also known as hypervolemia in the Indonesian Nursing Diagnosis Standards, almost common problems associated with CKD (IDHS). According to studies Angraini & Putri (2016) fluid volume excess or hypervolemia is one of the most common issues that chronic kidney disease patients will facing and experienced.

It reflects results from a study conducted at a Tertiary Care Hospital in Northeastern Malaysia. Patients with a confirmed diagnosis of CKD who visited the outpatient nephrology clinic (stages 3 to 5 non-dialysis) 64 (20.5%) of the 312 patients had experienced hypervolemia, and 135 (43.4%) actually experiencing it. There were 144 diuretic users in all, with 98 (72.6%) having hypervolemia and 35 being average (30.9 percent). The majority of patients with stage 5 CKD fell into to the hypervolemia matter (Khan et al., 2016) . According to Oquendo et al, (2017), hemodialysis patients should strictly manage their usual life style and eat pattern including fluid and dietary restriction because those who do not adhere to treatment have a higher mortality rate, which may linked to cardiovascular disease. Researchers found in 2015 that the number of CKD patients registering in HD units in Indonesia is rising by 10% every year. The prevalence of CKD is estimated to also be 400 per 1 million people, with a number of 15,424 CKD patients in 2015 (IIR, 2015). According to the 2016 IRR, three - quarters of GGK patients experience HD therapy, only with 2% receiving peritoneal dialysis.

As according IRR data in CKD patients, the percentage of patients undergoing HD increased to 77,892 in 2017 (Siela, 2017).

Meanwhile the world health organization, chronic kidney failure affects 10% of the global population, with 1.5 million people undergoing hemodialysis (HD). Every year, the amount of people on hemodialysis for chronic kidney disease increases by 8%. According to the National Chronic Kidney Disease information sheet from 2017, chronic kidney failure impacted 30 million people (15%) in the United States. In their research, Vijay and colleagues observed that the average incidence of non adherence to diet about (47.3-72.5%) and fluid about (50-70.7%) restrictions was significantly high and expanded (Vijay & Kang, 2021). In previous studies, compliance rates for fluid and dietary restrictions, medications, and frequent dialysis treatments ranged from 96.6 percent to 26 percent, 98.8% to 17.6%, 98.8% to 19.6%, and 100 percent to 67.7%. According to a previous study, many patients had difficulty adjusting to the diet (81.4%) and fluid (74.6%) restrictions. Non-adherence was shown to be more common in younger male patients and smokers, and also increasing amounts of IDWG (Beerappa & Chandrababu, 2019).

The quantity of sodium and amount of fluid intake in patient consumed daily is affected by the patient's ability to maintain symptoms and disease processes, especially in patient chronic kidney disease on hemodialysis. Li et al., 2020 described self-management as an activity that patients should be participate in on a daily basis in order to manage or minimize the impact of disease on their physical health. Self-management contain information about to acceptance, to maintain medication management, symptom management, emotional effects, to adjust new lifestyle changes, to using social support, and communication with the health care people . All the fulfill task will be lead to adherence the patient to agreed and willing to follow the specific diets, such as low-salt meal options and fluid restriction (Gurning et al., 2018).

The attitude in managing fluid is a common problem in patients with chronic kidney disease on hemodialysis. As a result of an excess fluid, many hemodialysis patients experience edema in their legs and ankles, and associated with high blood pressure, and other complication . Fluid and dietary control is an aspect of self-management. Patients find it difficult to limit the fluid intake, especially if they are taking medications that cause the membrane mucus to dry out, such as diuretics, that cause thirst and push them to drink. It happens because healthy persons cannot go longer without water than they can eat. .Achieve an adherence to therapy on hemodialysis is crucial to manage, in reason accumulation of dangerous substances from body metabolism in the blood and leading to another damage (Kartini et al., 2020).

Dietary and fluid restrictions are recommended to reduce the risk of morbidity and mortality associated with renal failure disease, the reason is the most CKD patients, unable to achieve the initial plan their disease's dietary and fluid recommendations. In fact, data showed more than 50% of dialysis patients had inadequate control nutritional and fluid intake , they eat to much salt and they drink to much fluid . The way is had excessive intake of phosphorus, sodium, calcium, and potassium that leading and provoke thirsty . Dietary restrictions have been shown to be difficult to follow for many patients with chronic kidney disease on hemodialysis , its take 50% of people diagnosed with chronic kidney disease unable to do the task (Opiyo et al., 2019).

Therefore on a few facts about lack of self management and adherence to fluid restriction and dietary intake, the research would review some journals that contain information about the connection between self management and adherence in CKD or ERSD or patients on hemodialysis to fluid restriction and diet intake (sodium).

RESEARCH METHODS

This research method is Literature review where the data used in this study comes from reputable journal articles both nationally and internationally that have been published in national and international online journals. The search was limited to articles that discussed the relationship of self-management in hemodialysis patient adherence to fluid and low sodium diet management on the incidence of hypervolemia.

The selection of themes and determining keywords and boolean operators (AND, OR NOT or AND NOT) were carried out before searching for scientific articles online. The keywords in this Literature Review are adjusted to MeSH (Medical subject heading). The literature search in this literature review used three databases with moderate quality criteria, namely PubMed, Science-Direct and Scopus. Articles searched from the database are identified and evaluated whether they are in accordance with the topic to be reviewed. The search technique uses specific keywords from the research question.

Table. 1
Keyword Database

Database	Search statement	Filters	Result
Pubmed	(self management OR adherence) AND (Fluid restriction) AND (diet restriction)	5 years : 35 Full text : 30 Language : 2 Not Hemodialysis : 8 Review : 5	15
Science-Direct	(Self management AND Adherence AND Fluid restriction AND CKD AND NOT CHF)	5 years : 44 Qualitative studt : 3 Review Study : 5 Not subject areq : 19	17
Scopus	Self Management AND Fluid Restriction AND CKD OR Chronic Kidney Disease AND exclude OA "publisherhybridgold" OR exclude OA "publisherfree2read"	5 years : 11 Qualitative 2 Review : 1 Book : 2	5

Article Inclusion and Exclusion Criteria

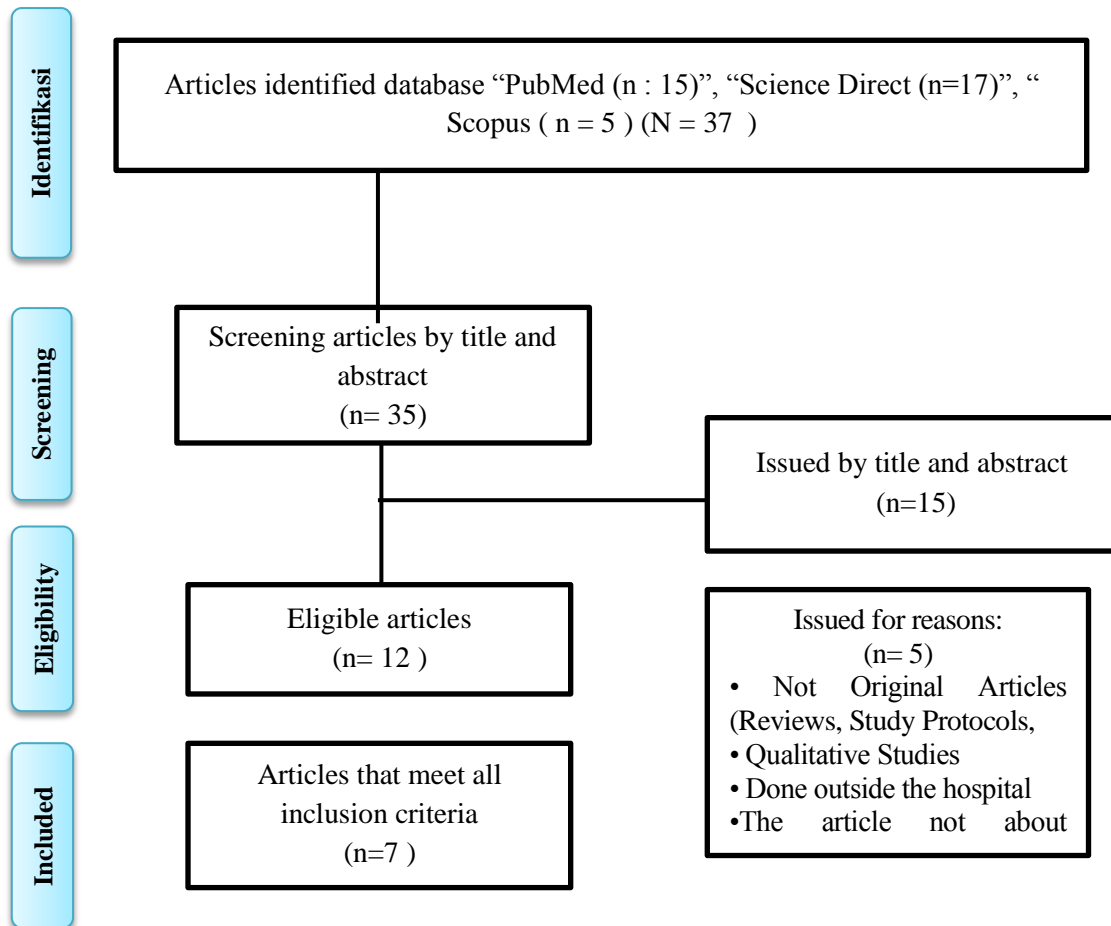
Inclusion Criteria

The inclusion criteria used in determining an article worthy of inclusion in the review are:

Studies are included if published in English and/or Indonesian with the year of publication starting from January 2017 to December 2022 February. All research articles with a quantitative study design (eg, cross-sectional, prospective and retrospective cohort). The study population in patients with ESKD (End-stage Kidney Disease), Chronic Renal Failure, Chronic Kidney Disease, and patients with hemodialysis.

Exclusion Criteria

The exclusion criteria from this literature review are: research article with qualitative design, study protocol meta-analysis and review. Articles that are only abstract



Picture. 1
PRISMA

RESULTS

Table. 2
Literature Review

Author Name, Article Title, Literature Type	Year	Aims	Findings
Beerapa & Chandrababu, Adherence to dietary and fluid restrictions among patients undergoing hemodialysis: An observational study, The Observational study	2019	To assess the level of adherence to dietary and fluid restrictions among patients undergoing hemodialysis.	Personalized actions are necessary to improve adherence and achieve a positive outcome.

Perdana & Yen, Factors Associated With Adherence to Fluid Restriction in Patients Undergoing Hemodialysis in Indonesia, A cross-sectional study	2021	To determine the factors that predict patient adherence to fluid intake restrictions	Results: The findings revealed that a majority of respondents did not comply the fluid intake restrictions to the strict (59.5 percent). Self-efficacy (p.05, = -.201), gender (p.05, = -.179), and educational background (p = .05, = .159), and urine output (p.05, = -.168) was found to have the big seat correlations with intradialytic weight gain and although Self-efficacy explained 3.9 percent of the variance in fluid adherence,
Li et al., Effects of ankle pump exercise frequency on venous hemodynamics of the lower limb Quasi-experimental design with convenient sampling	2020	(1) to compare the effects of ankle pump exercise(APE) frequency on hemodynamics of the common femoral vein(CFV) and (2) to analyse the relationship between APE duration and lower limb fatigue	Theself-management program proven boosted patients' health-related quality of life in the mental health elements with p value (p.001), and aspect self-efficacy (p.005) the research conducted in three months after the intervention. This program also induced patients to practice self-care to achieve quality of life among patient CKD on hemodialysis
Wu et al., Effectiveness of an innovative self-management intervention on the physiology, psychology, and management of patients with pre-end-stage renal disease in Taiwan: A randomized, controlled trial	2018	To investigate the effectiveness of an innovative self-management program on the physiology, psychology, and management of patients with pre-ESRD.	Improvements in physiological markers like BUN and creatinine, and also psychological markers including depression, self-efficacy, and self-management, reached statistical significance.
Purba et al., Self-Management and Self-Efficacy In Hemodialysis Patients, quantitative descriptive research.	2018	To determine patients' self-management and self-efficacy in chronic renal failure patients who had hemodialysis at Advent's Hospital Bandung	Self-belief in self-management improves medication adherence, disease control, and reduces mortality rates.
Baser & Mollaoglu, The effect of a hemodialysis patient education program on	2019	To determine the effect of the Hemodialysis Patient Education Program on	Certainly was contributed to adherence in dietary and fluid restrictions on pasien Chronic kidney disease ON

fluid control and dietary compliance. Hemodialysis International, Un-blinded prospective trial		Fluid Control and Dietary Compliance.	hemodialysis .
Beerendrakumar et al., Dietary and Fluid Regime Adherence in Chronic Kidney Disease Patients, Cross sectional survey	2018	To find out Diet and Fluid Compliance in Chronic Kidney Disease Patients	To reduce the morbidity due to renal failure, patients should adhere to the dietary and fluid requirements.

The findings revealed that a majority of respondents did not comply the fluid intake restrictions to the strict (59.5 percent). Self-efficacy ($p.05, = -.201$), gender ($p.05, = -.179$), and educational background ($p = .05, = .159$), and urine output ($p.05, = -.168$) was found to have the big seat correlations with intradialytic weight gain and although Self-efficacy explained 3.9 percent of the variance in fluid adherence.

Theself-management program proven boosted patients' health-related quality of life in the mental health elements with p value ($p.001$), and aspect self-efficacy ($p.005$) the research conducted in three months after the intervention. This program also induced patients to practice self-care to achieve quality of life among patient CKD on hemodialysis.

DISCUSSION

Hypervolemia is a condition that is characterized by the kidneys' inability to absorb body fluids, and also clinical manifestations of nephritis syndrome, high blood pressure, and low urine production, in which the fluid that must be excreted accumulates in muscle tissue and even the lungs, arising in lung edema. (Hypervolemia), which implies the patient needs to start hemodialysis right away to just get rid of the urea toxin and extra fluid (Agustin et al., 2020).

The severe effects of high salt intake in end-stage chronic kidney disease patients, similarity to early CKD stages, are mostly related to fluid overload, leading to high blood pressure, left ventricular hypertrophy, and increased CV mortality. The incidence of hypervolemia in chronic renal failure patients undergoing hemodialysis expanded e to kidney failure in maintaining metabolism and fluid and electrolyte balance due to progressive damage to the structure and function of the kidney, that shown in manifestations of accretion of metabolic wastes (toxic uremia) in the blood related to kidney dysfunction which cannot absorb and excrete materials that are not needed by the body and leading to hypervolemia (Agustin et al., 2020).

When someone is able to go through a process of attitude change by using self-created strategy supporters or good coping mechanisms with the aim of being better than before, besides that, Gie in Sugiarto, states of that self management is an impulse that comes from within a person who is able to controlling his ability to achieve good things, is a process where a person is able to change his attitude or in another statement a person's self-management can become better because of an effort and motivation that arises in a person so that he is able to manage himself well, then the individual is called having good self-management ability (Sugiarto et al., 2021).

Aspects of self-management consist of Sugiarto et al., (2021) 1) Self Motivation: An individual who has the drive in himself is able to add enthusiasm to himself so that the individual can carry out various activities to achieve the desired goals because of the encouragement of interest and a strong desire to get pleasure or something he wants. 2) Self Organization : Individuals are able to manage everything related to thoughts, energy and time as well as others that can help the formation of self-management. 3) Self Control: Individuals have the ability to control themselves consciously when they have a goal to fulfill the achievement of desires that do not harm others. 4) Self Development : It is a self-potential development activity to increase self awareness.

Self-management, according to Stewart and Luwis, refers to an individual's ability to direct his behavior or to do things with a purpose, even when those efforts are challenging (Siela, 2017). Adherence to medication prescriptions, adherence to diet and fluid restrictions, and complete adherence to HD sessions are considered partially responsible for the success of patients on long-term HD therapy. Adherence failure in HD patients can lead to an increase in morbidity, mortality, cost, and burden also on health care system (Naalweh et al., 2017).

The Self-management model provides a system for identifying and explaining patterns among patient on hemodialysis , that included factors that influence an individual's capacity to maintain the symptoms, the various treatment, lifestyle changes particularly in physical and psychosocial effects of health conditions, and major in fluid intake and dietary intake management. Self-management has also been defined as a part of self-care behavior, with the aim of controlling actual or potential self-monitoring, symptom management, and other related behaviors. The concept of disease self-management relates to self care (Wu et al., 2018).

Adherence to dietary regimens is difficult for chronic Hemodialysis patients due to the burden of constant food and drink choices, adaptation to complex eating patterns, established cultural practices, and the competing demands of this chronic disease and related illnesses therefor, self-care behavior requires taking prescribed medications, caring for vascular access, and, most importantly, following dietary recommendations such as eating foods low in sodium, potassium, and phosphorus, getting enough protein, and limiting daily fluid intake (Nerbass et al., 2017).

Self-management is also defined as a person's ability to manage illness conditions and lifestyle changes that must be formed as a result of chronic pain. Self-management is crucial in CRF patients to prevent disease progression (Purba et al., 2018). Hemodialysis patients require optimal treatment management, which includes controlling weight gain between hemodialysis sessions as well as laboratory values such as hemoglobin, urea, and creatinine. To achieve optimal treatment management, they require good self-management in order to complete the hemodialysis process and avoid more serious complications. Fluid restriction, nutritional diet, drug management, and exercise are all part of the treatment plan (Purba et al., 2018).

Devastated and unprepared patients for the intrusive and exhausting nature of hemodialysis treatment, that is including self management in fluid and dietary control, particularly when they were first started it, and they thought most couldn't commit enough attention to dietary and fluid control. Sudden and serious health problems, they have to attend hemodialysis treatment and put their ability to control their diet in risk, and many were incapable of doing either. Patients intended to take control of their health by developing self-management strategies, therefore they adapted the renal dietary and fluid recommendations to adapt their new lifestyle than the health old one (Stevenson et al., 2018). Adherence relates to

an individual's conduct and effort in pursuing the aim of being healthy by following advice for self-care (also including taking medication, following a diet, or adopting lifestyle changes). Compliance might span from following all aspects of the recommendation to following the plan (Siela, 2017).

Natashia et al., (2019) discovered in their study that medication adherence was the one kind common self-management behavior, followed by self-care, self management, communication, partnership in care, and self advocacy behavior. Level of education, knowledge, and family support all are associated with restricting fluid intake in patients on hemodialysis with chronic kidney disease. Family support is the most important of the three factors. Furthermore, there is a relationship between family support and knowledge level. Patients with chronic kidney disease who do have strong family support will be more cooperative and also nurses should educate patients about the importance of restricting fluid intake and encourage them to involve their families in the program (Kartini et al., 2018) .

Opiyo et al., (2019) stated in their study that diet prescriptions including adherence patients in fluid restrictions are more inclined to keep to their eating plans. Intake low sodium diet management related to lowers thirst in hemodialysis patients due to fluid retention. Continuous education and supervision can improve the patient's self-management behavior every day, as shown by reducing daily salt intake behavior. Patient adherence to hemodialysis treatment management could include reducing daily salt intake Gurning et al., (2018) mention s alt or sodium restriction plan will be polished running if there is a synergy between the patient, family (caregiver), or health workers. The low sodium diet management strategy utilized in this research is a synergistic approach that incorporates education, counseling, and home visits as a type of observation with the expectation of positive patient instructions.

According from the synthesis journal Perdana & Miaofen (2021) also was revealed in their research, majority of respondent did not comply the fluid intake restriction on fluid adherence was have a big seat correlations with patient self management how to create a self efficacy to improving the adherence in fluid restriction. Self management also need a personalized action to improving adherence and achieve a positive outcome in fluid and dietary restriction to avoiding fluid excess (edema extremities or lung edema) (Beerappa & Chandrababu, 2019). To develop a self management in CKD on hemodialysis patient, need an external supporting to boosting patient in self efficacy, the self management program was found completely proven as a health program to boosted patient self care, this study's findings confirmed that self-management programs should be promoted in clinical practice where they will provide clinical care personnel with an alternative to conventional health education.

Self-management has been conceptualized as a subset of self-care behavior, through approaches the patient to encourage to set personal goals and help them to application self confident to actually execute self-care practices. A study that investigated the factors that are associated with self-management behaviors in patients found that there was a highly positive correlation between self-management and self efficacy and the innovative self-management program, proved effectively decreased patient functional indicators (blood urea nitrogen, creatine, and also it will be continuing to follow with edema reducing and enhanced their self efficacy and self-management (Wu et al., 2018). Purba et al., (2018) identified self-management of CRF patients with hemodialysis include their ability to manage themselves to communicate with health professionals, build a partnership with health workers, self-care, self-advocacy, and adherence to treatments. In hemodialysis patients, the nurses and other health

system personnel should identify strategies to improve communication with reinforcing dietary counseling to patients and family members to help them to adhere with treatment regimen, and dietary guidelines, through the adherence to the dietary and fluid components is essential to reduce the morbidity related to renal dysfunction (Başer & Mollaoğlu, 2019).

In healthcare system, mainly in hemodialysis patients, the nurse and other health system personal should identify and define strategies to improve communication with reinforcing dietary counseling patients and family member to help them especially the patient to achieve adherence with treatment regiment, dietary guidelines and fluid restriction, Beerendrakumar et al., (2018) find in their study that adherence to the dietary and fluid components is essential to reduce the morbidity related to renal dysfunction. “Dry weight” is a frequently summarized management salt and water (fluid) in dialysis patients, although this clinical approaching has been associated with benefit on cardiovascular outcome, proven by several recent studies that showing when to tensify or aggressiveness to remove fluid during ventional thrice-weekly dialysis might be persuade the patient in excessive hemodynamic stress and potential oegan damage with potentially long-term consequences (Canaud et al., 2019). On Ohashi et al., (2018) also agreed and give advising to the patient consistently on Hemodialysis to practice first with salt and fluid restriction by providing appropriate nutritional support support for patients on a downward trend in their dry weight, would be extremely beneficial in reversing malnutrition and achieving optimal fluid volume status

CONCLUSION

Is there a self-management association for hemodialysis patients on adherence to fluid and dietary restrictions, particularly sodium restrictions. When a patient is able to control their own health by performing self-care, adopting self-management techniques, and adapting renal dietary and fluid guidelines to fit into their lifestyle, the risk of hypervolemia is reduced. The integrated self-management program significantly affected self-efficacy and adherence, treatment compliance, and the ratio of interdialytic weight gain to dry weight.

Problem-solving, decision-making, action planning, and goal-setting are all important aspects of enhancing adherence to daily Self Management behaviors when self management includes adherence improvements. In chronic disease management, reading food labels, eating correctly, enhance clinical communication, and improving medication adherence are all key Self Management practices.

SUGGESTIONS

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REFERENCE

- Agustin, I. M., Pangesti, P., & Mutoharoh, S. (2020). Respon Penerimaan Diri Pasien Gagal Ginjal Kronik dengan Menjalani Hemodialisa di RS X. *Konferensi Nasional (Konas) Keperawatan Kesehatan Jiwa*, 4(1), 42–48. <https://journalpress.org/proceeding/ipkji/article/view/42/0>
- Angraini, F., & Putri, A. F. (2016). Pemantauan Intake Output Cairan pada Pasien Gagal Ginjal Kronik Dapat Mencegah Overload Cairan. *Jurnal Keperawatan Indonesia*, 19(3), 152–160. <http://jki.ui.ac.id/index.php/jki/article/view/475>

- Başer, E., & Mollaoğlu, M. (2019). The Effect of a Hemodialysis Patient Education Program on Fluid Control and Dietary Compliance. *Hemodialysis International*, 23(3), 392–401. <https://doi.org/10.1111/hdi.12744>
- Beerappa, H., & Chandrababu, R. (2019). Adherence to Dietary and Fluid Restrictions among Patients Undergoing Hemodialysis: An Observational Study. *Clinical Epidemiology and Global Health*, 7(1), 127-130, <https://doi.org/10.1016/j.cegh.2018.05.003>
- Beerendrakumar, N., Ramamoorthy, L., & Haridasan, S. (2018). Dietary and Fluid Regime Adherence in Chronic Kidney Disease Patients. *Journal of caring sciences*, 7(1), 17–20. <https://doi.org/10.15171/jcs.2018.003>
- Canaud, B., Chazot, C., Koomans, J., & Collins, A. (2019). Fluid and Hemodynamic Management in Hemodialysis Patients: Challenges and Opportunities. *Brazilian Journal of Nephrology*, 41(4), 550–559. <https://doi.org/10.1590/2175-8239-jbn-2019-0135>
- Chen, Y., Chang, L., Liu, C., Ho, Y., Weng, S., & Tsai, T. (2018). The Roles of Social Support and Health Literacy in Self-Management among Patients with Chronic Kidney Disease. *Journal of Nursing Scholarship*, 50(3), 265–275. <https://doi.org/10.1111/jnu.12377>
- Gurning, L., Purba, J. M., & Siregar, C. T. (2018). Influence of Low-Sodium Diet Management on Thirst Response In End Stage Renal Disease Patients with Hemodialysis. *Belitung Nursing Journal*, 4(2), 128–134. <https://www.belitungraya.org/BRP/index.php/bnj/article/view/319>
- Kara, M., Erdoğan, F., Kokoç, M., & Cagiltay, K. (2019). Challenges Faced by Adult Learners in Online Distance Education: A Literature Review. *Open Praxis*, 11(1), 5-22. <http://dx.doi.org/10.5944/openpraxis.11.1.929>
- Kartini, D., Siswiandari, M. K., Wibisana, G., Yulian, E. D., Kurnia, A., Panigoro, S. S., Albar, A. Z., & Ramli, M. (2018). Craniofacial Brown Tumor in Patients with Secondary Hyperparathyroidism to Chronic Renal Failure: Report of Two Cases in Cipto Mangunkusumo Hospital. *Hindawi*, 2018. <https://doi.org/10.1155/2018/1801652>
- Kartini, Y., Setiawan, R., Astuti, P., Wijayanti, L., & Soleha, U. (2020). Factors Related to Adherence to Limiting Fluid Intake in Hemodialysis Patients with Chronic Kidney Disease in Hemodialysis Room. *International Journal of Psychosocial Rehabilitation*, 24(9), 1032–1038. <http://repository.unusa.ac.id/id/eprint/6323>
- Khan, Y. H., Sarriff, A., Adnan, A. S., Khan, A. H., & Mallhi, T. H. (2016). Chronic Kidney Disease, Fluid Overload and Diuretics: A Complicated Triangle. *PloS One*, 11(7), e0159335. <https://doi.org/10.1371/journal.pone.0159335>
- Li, T., Yang, S., Hu, F., Geng, Q., Lu, Q., & Ding, J. (2020). Effects of Ankle Pump Exercise Frequency on Venous Hemodynamics of the Lower Limb. *Clinical Hemorheol Microcirc* 76(1), 111–120. <https://doi.org/10.3233/ch-200860>
- Naalweh, K. S., Barakat, M. A., Sweileh, M. W., Al-Jabi, S. W., Sweileh, W. M., & Zyoud, S. H. (2017). Treatment Adherence and Perception in Patients on Maintenance Hemodialysis: A Cross-Sectional Study from Palestine. *BMC Nephrology*, 18(1), 1–9. <https://doi.org/10.1186/s12882-017-0598-2>
- Natashia, D., Yen, M., Chen, H., & Fetzer, S. J. (2019). Self-Management Behaviors in Relation to Psychological Factors and Interdialytic Weight Gain Among Patients Undergoing Hemodialysis in Indonesia. *Journal of Nursing Scholarship*, 51(4), 417–426. <https://doi.org/10.1111/jnu.12464>

- Nerbass, F. B., Pecoits-Filho, R., Clark, W. F., Sontrop, J. M., McIntyre, C. W., & Moist, L. (2017). Occupational Heat Stress and Kidney Health: From Farms to Factories. *Kidney International Rep*, 2(6), 998-1008. <https://doi.org/10.1016%2Fj.ekir.2017.08.012>
- Ohashi, Y., Sakai, K., Hase, H., & Joki, N. (2018). Dry Weight Targeting: The Art and Science of Conventional Hemodialysis. *Seminars in Dialysis*, 31(6), 551–556. <https://doi.org/10.1111/sdi.12721>
- Opiyo, M. A., Jumbe, J., Ngugi, C. C., & Charo-Karisa, H. (2019). Different Levels of Probiotics Affect Growth, Survival and Bodu Composition of Nile Tilapia (*Oreochromis Niloticus*) Cultured in Low Input Ponds. *Scientific African*, 4, e00103. <https://doi.org/10.1016/j.sciaf.2019.e00103>
- Oquendo, M. A., Sullivan, G. M., Sudol, K., Baca-Garcia, E., Stanley, H., Sublette, M. E., & Mann, J. J. (2014). Toward a Biosignature for Suicide. *Am Journal Psychiatry*, 171(12), 59-77. <https://doi.org/10.1176/appi.ajp.2014.14020194>
- Park, O. L., & Kim, S. R. (2019). Integrated Self-Management Program Effects on Hemodialysis Patients: A Quasi-Experimental Study. *Japan Journal of Nursing Science*, 16(4), 396–406. <https://doi.org/10.1111/jjns.12249>
- Perdana, M., & Yen, M. (2021). Factors Associated With Adherence to Fluid Restriction in Patients Undergoing Hemodialysis in Indonesia. *The journal of nursing research : JNR*, 29(6), e182. <https://doi.org/10.1097/jnr.0000000000000457>
- Purba, A. K., Emaliyawati, E., & Sriati, A. (2018). Self-Management and Self-Efficacy in Hemodialysis Patients. *Journal of Nursing Care*, 1(2), 129-139. <https://doi.org/10.24198/jnc.v1i2.16137>
- Siela, F. A. R. (2017). *Hubungan Kepatuhan Pembatasan Cairan terhadap Terjadinya Hipervolemia pada Pasien Gagal Ginjal Kronik di Ruang Hemodialisa RSUD dr. Harjono Ponorogo*. STIKES Bhakti Husada Mulia. <http://repository.stikes-bhm.ac.id/id/eprint/234>
- Stevenson, M. P., Schilhab, T., & Bentsen, P. (2018). Attention Restoration Theory II: A Systematic Review to Clarify Attention Processes Affected by Exposure to Natural Environments. *Journal of Toxicology and Environmental Health, Part B*, 21(4), 227-268. <https://doi.org/10.1080/10937404.2018.1505571>
- Sugiarto, S., Widyana, R., & Yunika, N. (2021). Efektivitas Pelatihan Manajemen Diri untuk Meningkatkan Kedisiplinan Siswa SMA N1 Sedayu. *PSYCHE: Jurnal Psikologi*, 3(1), 22–37. <https://doi.org/10.36269/psyche.v3i1.298>
- Vijay, V. R., & Kang, H. K. (2021). The Worldwide Prevalence of Nonadherence to Diet and Fluid Restrictions Among Hemodialysis Patients: A Systematic Review and Meta-analysis. *Journal of Renal Nutrition*. <http://dx.doi.org/10.1053/j.jrn.2021.11.007>
- Wu, S. F. V., Lee, M. C., Hsieh, N. C., Lu, K. C., Tseng, H. L., & Lin, L. J. (2018). Effectiveness of an Innovative Self-Management Intervention on the Physiology, Psychology, and Management of Patients with Pre-End-Stage Renal Disease in Taiwan: A Randomized, Controlled Trial. *Jpn J Nursing Science*, 15, 272-284. <https://doi.org/10.1111/jjns.12198>