



CHARACTERISTIC DESCRIPTION OF COMPLIANCE WITH FLUID LIMITATION, INTERDYALITIC WEIGHT GAIN (IDWG), AND QUALITY OF LIFE IN HEMODIALYSIS PATIENTS IN PALEMBANG CITY

Fermata Sari, Raveinal, Esi Apriyanti

Universitas Andalas

Email : tatatomy27@gmail.com, raveinal_pdg@yahoo.co.id, esi_afriyanti@yahoo.com

ABSTRACT	Keywords
<p>Most of the world's end-stage chronic kidney disease patients undergoing hemodialysis as treatment. Patients with hemodialysis are required to carry out routine care, diet arrangements, and fluid restrictions. The highest non-compliance in patients is fluid restriction. Excessive fluid intake can be seen from weight gain between dialysis time (IDWG). IDWG in hemodialysis patients should not be more than 3.5%, where an increase in IDWG could cause the risk of death and decreased quality of life. The purpose of this study was to explore the characteristics, fluid restriction compliance, IDWG, and quality of life in hemodialysis patients. This was done to plan the provision of further intervention in patients. The design of this study was cross-sectional, the number of samples of this study 34 people undergoing hemodialysis, a sampling method that is probably using a simple random sampling technique. All data was analyzed using frequency distribution and percentage. The research instrument was a questionnaire sheet consisting of questionnaire data of respondent characteristics, questionnaire of fluid restriction compliance, and Kidney Disease Quality Of Life Short Form 1.3 (KDQOL-SF 1.3). The instrument for measuring IDWG used digital weight scales by existing ISO certified medical standar. The results of the study was characteristics of respondents at the age of 46-55 years was (64.7%), more male was (55.9%), and high school education was (47.1%), all respondents were married (100%), jobless people were (58.8%), the average length of hemodialysis was 18 months. The mean liquid restriction compliance was 27.35, the mean, value of IDWG was 4.97 and the mean value of quality of life was 51.72.</p>	<p>Characteristics of respondents, compliance with fluid restrictions, IDWG, the quality of life</p>

INTRODUCTION

Hemodialysis causes changes in the lives of patients with chronic kidney disease where the patient is dependent on the dialysis machine (Tzanakaki et al., 2014). Most of the world's end-stage chronic kidney disease patients undergoing hemodialysis as treatment. Patients with chronic kidney disease with hemodialysis are required to carry out routine maintenance, dietary

arrangements, and fluid restrictions. Uncontrolled fluid restriction causes various complications such as hypertension, intradialytic hypotension, left heart failure, ascites, pleural effusion, congestive heart failure, and can lead to death (Tamaura, Nishitani, et al. 2019).

The highest non-compliance in hemodialysis patients is fluid restriction. Research conducted by Alikari, et al. (2015) regarding

fluid overload in patients with hemodialysis, found that 76% of respondents were not adherent to fluid infections and 53% patients experienced fluid overload. In the Mahjubian, Bahraminejad, & Kamali (2019) study, it was found that 10.0% -60% of hemodialysis patients did not comply with fluids, 2% -57% patients did not adhere to diet, 19% patients did not adhere to dialysis, and 9% patients did not adhere to take medication. According to Mina et al (2019), the most difficult component of compliance in hemodialysis patients is the fluid restriction with a percentage of 86% of hemodialysis patients experiencing increased thirst. Excessive fluid intake can be seen from weight gain between dialysis times. IDWG is a visual method for measuring the level of adherence to fluid intake (Ramezani et al. 2019). IDWG in hemodialysis patients should not exceed 5%, IDWG. Increasing IDWG can cause a risk of death and decreased quality of life (Kahraman, 2015). Improving the quality of life of patients with hemodialysis depends on good knowledge of the amount of fluid intake. This knowledge can be obtained from health workers, one of them by nurses. Education in patients with end-stage chronic kidney disease is not only about knowledge, but the most important thing is to ensure that patients can be taught to be involved in self-care management (Narva, Norton, & Boulware, 2016).

Compliance of patients with hemodialysis in limiting fluid is influenced by the patient's characteristics both internal, and external factors, factors that can affect compliance with fluid restrictions include age, sex, education, length of undergoing hemodialysis, family support, support from medical personnel, and self efficacy (Kartini Aprilia, Ismona, 2015). So, to provide effective education, these factors need to be considered in providing education. Educational innovations are needed so that

the information provided can influence patients to manage fluid.

The result of preliminary studies found that patients who performed hemodialysis at PUSRI Hospital were given health education by lecturing methods, the nurses followed standard operating procedures regarding fluid restriction at the first time of conducting a hemodialysis, but the results of interviews conducted with hemodialysis patients in the hemodialysis room Palembang PUSRI Hospital using a questionnaire guide obtained from 75 patients undergoing hemodialysis, 42 patients showed self-efficacy was <75 , and an increase in IDWG was ≥ 3 , 5%, this increased body weight occurred due to the patient being unable to limit fluids because he could not hold thirst. The patient said that he already knew if he had to limit fluid intake in order not to cause shortness of breath and edema.

Based on the phenomenon, and the description above, researchers are interested in conducting a research study on the characteristics of fluid restriction compliance, interdialytic weight gain (IDWG), and quality of life in hemodialysis patients. This research was a quantitative study with cross-sectional survey design and using a questionnaire sheet consisting of questionnaire data of respondent characteristics, questionnaire of fluid restriction compliance, and Kidney Disease Quality Of Life Short Form 1.3 (KDQOL-SF 1.3), and the instrument for measuring IDWG used digital weight scales by existing ISO certified medical standards. The purpose of this study was to explore the characteristics, fluid restriction compliance, IDWG, and quality of life in hemodialysis patients

METHOD

This research was a quantitative study with cross-sectional survey design. The research design used simple random sampling technique in hemodialysis patients at the PUSRI Hospital in Palembang in 2020, the number of samples of this study 34 people undergoing hemodialysis. The inclusion criteria in this study were chronic kidney disease patients with hemodialysis aged 20 - 60 years, patients with weight gain $\geq 3.5\%$, hemodialysis 2-3 times a week, and willing to be a respondent. All data was analyzed using frequency distribution and percentage.

The research instrument was a questionnaire sheet consisting of questionnaire data of respondent characteristics, questionnaire of fluid restriction compliance that had been tested for validity, and Kidney Disease Quality Of Life Short Form 1.3 (KDQOL-SF 1.3). The instrument for measuring IDWG used digital weight scales by existing ISO certified medical standards in the hemodialysis room. The respondent's characteristic questionnaire consisted of gender, age, last education, occupation, and duration of hemodialysis. The research was conducted from February to March 2020. In the initial stage, before the study was conducted, researchers had obtained a Certificate of Research Ethics Passing in the Research Ethics Committee of the Faculty of Medicine of Andalas University letter number 045 / KEP / FK / 2020 on January 17, 2020. Then The researcher asked the respondent to fill out an informed consent sheet, then the respondent filled in the questionnaire on fluid restriction and quality of life. Researchers also weighed after hemodialysis (post hemodialysis) used the same weight scales available in the Rs Pusri Palembang hemodialysis room for all study subjects, the result of weight after hemodialysis was made as post-dialysis weight measurement I. In the second

hemodialysis schedule in the first week the researchers weighed the body before the patient did the hemodialysis, and this data was made as a pre-dialysis I weight measurement, and also weighed the body weight after dialysis. The results of weighing the first post hemodialysis body weight (a measure I) and pre-dialysis bodyweight the second day (a measurement of predialysis II) were calculated the difference multiplied by 100%. This weight was used as an interdialytic weight. The data obtained were analyzed univariately. The results of weighing the first post hemodialysis body weight (a measure I), and predialysis bodyweight the second day (a measurement of predialysis II) were calculated the difference multiplied by 100%. This weight was used as an interdialytic weight. The data obtained were analyzed univariately. The results of weighing the first post hemodialysis body weight (a measure I), and predialysis bodyweight the second day (a measurement of predialysis II) were calculated the difference multiplied by 100%. This weight was used as an interdialytic weight. The data obtained were analyzed univariately.

RESULTS

The results of this study obtained 34 respondents, then the characteristics of respondents were compliance with fluid restrictions, IDWG, and quality of life are presented in the table below.

Table 1. Distribution of age frequency of hemodialysis patients, sex, education, marital status, and occupation (n = 34)

Characteristics	Total	%
Age (years)		
Early Adults (26-35)	4	11.8
Adult (36-45)	8	23.5
Elderly (46-55)	22	64.7
Gender		
Male	19	55.9
Female	15	44.1
Last education		
Elementary school	7	20.7
Middle School	5	14.7
High school	16	47.1
College	6	17.6
Marital status		
Married	34	100
Single	0	0
occupation		
PNS / TNI / POLRI	2	5.9
Office employee	1	2.9
Farmers	1	2.9
Entrepreneur / Private	8	23.5
IRT	2	5.9
Unemployment	20	58.8

Table 2. Duration of Hemodialysis Hemodialysis Patients (n = 34)

Characteristics	Mean (SD)	Min-Max
Duration of Hemodialysis (month)	17.74 (6.58)	6.00-32.00

Based on table 1 above, obtained the number of respondents in this study were 34 people. Characteristics of the study respondents included the age where the majority of the age 46-55 years (64.7%), more male were (55.9%), and have a high school education were (47.1%), all respondents were married (100%), jobless respondents were (58.8%), and the table 2 explained the average length of hemodialysis 18 months.

Table 3. Compliance with fluid restriction, IDWG and quality of life for hemodialysis patients

Variable	n	Mean (SD)	Min-Max
Fluid compliance	34	27.35	18.00-
compliance	34	(4,80)	36.00
IDWG	34	4.97	3,50-7,10
Quality of life		(0,96)	42.65-
		51.72	61.20
		(4,86)	

Besides, Table 3 stated the highest value of fluid restriction compliance was 36, and the lowest value was 18.00 with the average liquid restriction compliance 27.35. The mean value of IDWG was 4.97 with the highest value of 7.10, and the lowest of 3.50. The mean value for the quality of life score was 51.72 with the highest value of 61.20 and the lowest value of 42.65.

DISCUSSION

The results obtained were based on the characteristics of respondents, namely obtained some respondents in the range 46-55 years. This age range was in line with research cited Sitifia aisara, Syaiful Azmi (2015) stated that most chronic kidney disease sufferers undergo hemodialysis at the age of 40-60 years. This was also in line with research Pujiani (2017) stated 60% of respondents aged 41-60 years. Likewise in Wahyuni, et al. (2019) research, 61% of research respondents were aged 46-59 years. Age was one of the factors that cause chronic kidney disease, where aging occurs causing structural and functional changes to occur in the kidneys. Structurally, the number of nephrons will decrease. Glomeruli in the renal cortex were lost because of the aging process, kidney mass is also reduced. However, due to the large kidney reserve, kidney function remains adequate unless additional stressors affect the kidney system. Any additional stressors such as hypotension, exposure to nephrotoxic drugs, or inflammatory processes can trigger acute

episodes in older adults. Glomerulus Filtration Rate, the amount decreases every minute, due to age-related factors that affect the renovascular system (such as arteriosclerosis, decreased renal vascularization, and decreased cardiac output) (LeMone, et al. 2017). After about 30 years of age, the number of functioning nephrons begins to decrease due to the aging process, so Glomerulus Filtration Rate decreases proportionally, Glomerulus Filtration Rate is less than half at the age of 30 years. Serum creatinine levels can rise slowly because older people have less muscle mass, they produce less creatinine so Glomerulus Filtration Rate decreases proportionally, Glomerulus Filtration Rate was less than half at the age of 30 years. Serum creatinine levels can rise slowly because older people have less muscle mass, they produce less creatinine so Glomerulus Filtration Rate decreases proportionally. Glomerulus Filtration Rate is less than half at the age of 30 years. Serum creatinine levels could rise slowly because older people have less muscle mass, they produce less creatinine (Thomas, 2014). Based on the characteristics of the sex, there was 55 percent of male respondents who were male. In line with research Saefulloh & Nuraeni(2016) stated in his study the final stage of kidney disease patients who undergo hemodialysis most male sex is 72.7%. Beerappa & Chandrababu (2018) also stated in his study that as many as 73.3% of research subjects were male males undergoing hemodialysis. Male patients male have a higher risk than female because female patients have more estrogen than men. The hormone estrogen itself inhibited the formation of cytokines which can inhibit osteoclasts so as not to excessively absorb bone so that calcium levels are balanced. Calcium has a protective effect that prevents the absorption of oxalate which can form

kidney stones which is one of the causes of chronic kidney disease (Aria, et al. 2018).

The education of research subjects was based on the data obtained as much as 47.1% of high school education. In line with Wahyuni et al. (2019) Nearly most of the study respondents had a high school education background was 46.1%. (Hanum, Nurchayati, & Hasneli (2015) in their study stated that most respondents had a high school education of 30%. The level of education was often associated with a person's knowledge where a low level of education was related to a person's lack of access to health services. Due to lack of knowledge, a person's level of awareness was low to make early detection and check themselves into health services, this is one of the causes of an increase in patients with chronic kidney disease due to early-stage kidney disease there are no specific complaints.

The higher level of education of a person was considered to be easier to absorb the information provided so that the provision of nursing care can be adjusted to the level of education. Patients who had a higher education have a broad insight which allows patients to control themselves in overcoming what was being faced, had a sense of confidence, and could easily understand what was recommended by health workers (Sri Suparti, 2016). The higher a person's education, the sooner a person will look for information and understand about his illness, and seek help with treatment regimens.

The marital status of respondents obtained all respondents who had married status. In line with Mahjubian et al. (2019) stated that 86% of those undergoing hemodialysis were married. Kahraman (2015) also stated in his study that most patients with hemodialysis had a married status was 53.2%. Support from family, especially close family was very important

which can foster emotional ties that could increase the desire to obey the rules that should be followed. Based on research conducted by Nadi et al. (2015), the higher the social support in patients with chronic kidney disease undergoing hemodialysis, the better the patient adheres to the treatment regimen. Sousa et al. (2019) also stated that getting support from partners, family members, friends, and others has significantly succeeded in promoting better health for patients with chronic illness.

Based on work showed that the average work of research subjects did not work as much as 58.8%, where patients with chronic kidney disease with hemodialysis would trigger various physical problems that caused patients to experience a decrease in their ability to do activities. (Jos, 2016). Hemodialysis not only has an impact on physical conditions but also impacts psychological, economic, and social conditions. The state of dependence on the hemodialysis machine, and changes in lifestyle cause patients to have to adapt to changes in life. Patients must limit physical activity resulting in decreased productivity. If work requires high physical activity, it is not uncommon for patients to have to lose work when suffering from chronic kidney disease. In line with research conducted Mousa, et al. (2018) stated in his study that most patients who underwent hemodialysis did not work at 79.9%. The same thing was raised by Tamaura, Rd, et al. (2019) as many as 76. 2% of respondents in their study did not work due to suffering from chronic kidney disease with hemodialysis.

The duration of hemodialysis showed the average subject of respondents was 18 months old hemodialysis. The duration of hemodialysis in patients with chronic kidney disease would cause more frequent patients exposed to side effects from hemodialysis. Patients with chronic kidney disease were increasingly frequent patients doing

hemodialysis, patients would experience interference with kidney nephrons which would cause disorders of the circulatory and cardiovascular system, especially affecting blood viscosity. The change in viscosity disrupted the arterial baroreflex sensitivity system which in turn affects the heart, the body's blood pressure which was getting more irregular. This condition would cause more hemodialysis patients more likely to increase IDWG and decrease quality of life (Kasron, 2017). Based on research by Hanum et al. (2015) stated as many as 66. 7% of respondents had a duration of hemodialysis > 12 months. Sousa et al. (2019) also stated that most patients undergoing hemodialysis > 12 months were 97.5% of all respondents.

Based on the processing of the questionnaire data, it was found that the mean of liquid restriction compliance was 27.35 with a standard deviation of 4.80, the highest score of fluid restriction compliance was 36.00 and the lowest was 18.00. In this study, the researchers used the fluid restriction compliance questionnaire, which consisted of 12 questions. In the questionnaire related to the question of fluid management it was found that more than half of the respondents (> 50%) answered never, this was because the research subjects had been taught about fluid management and were initially done, but not done anymore because it was difficult to calculate the fluid that had to be drunk. Non-compliance of patients in following the treatment regimen could be done intentionally, the patient understood the treatment but chooses not to follow it, or was also done accidentally due to forgetfulness, and knowledge deficits (Johnson & State, 2016). There were many reasons for some people to obey, and not to adhere to treatment regimens, namely motivation to be good, there were lifestyle changes, perception of severity about the disease, ability to understand and perform

certain behaviors, level of discomfort of the disease or regimen given, belief that therapy or regimen given will help (Kozier et al., 2018).

The results of data processing IDWG values obtained a mean value of 4.97 standard deviations 0.96 the highest value was 7.10, and the lowest value was 3.50. Obtained most of the respondents had IDWG valued in the medium and heavy categories. The addition of IDWG for hemodialysis patients was also influenced by many factors, and one of the causes was the lack of adherence to restrictions on fluid intake, and dietary salt. Lack of patient compliance was often associated with a lack of patient ability to care for themselves, and also a lack of patient knowledge. Health education could improve patient knowledge about fluid intake restrictions and complications of hemodialysis so that ultimately it was expected to improve the ability to change in self management of patients with hemodialysis (Makmor, Maryam, & Osman, 2018).

Based on the results of the quality of life questionnaire sheet obtained an average value of quality of life was 51.72 with a standard deviation was 4.86, the highest value was 61.20, and the lowest was 42.65. In the questionnaire analysis, the researchers of 34 research subjects used the KDQoL 1.3 questionnaire consisting of 24 questions, the questions related to the physical health component of the overall health assessment of more than half of the study subjects (85.3%) answered below 50. Patients undergoing hemodialysis experiencing a variety of biological and psychosocial problems that arose in a patient's life. It can be stated that dependence on patients with hemodialysis caused results in changes in their lives, namely changes in spiritual biopsychosocial, patients will also face financial problems, inability to maintain employment, Pujiani (2017). In line with

research Nayana et al. (2017) patients underwent hemodialysis would experience physical health disorders including activities of daily living, dependence on drug ingredients and medical assistance, energy, and fatigue, mobility, pain, and discomfort, sleep, and rest, decreased work capacity thereby reducing the quality of life.

CONCLUSIONS

Adherence to fluid restriction in hemodialysis patients was the most difficult component because patients have difficulty holding back thirst which causes an increase in IDWG values and a decrease in the quality of life of patients. Most patients already know they must prevent excessive fluid intake between dialysis times but it is still difficult to comply. Support of health workers has a very important role to support adherence in kidney disease patients undergoing hemodialysis. The role of the nurse is to change behavior and direct activities towards a goal so that it becomes a readiness for a person to move towards obedience to fluid restrictions either consciously or unconsciously. Therefore we need educational innovations that can improve the self efficacy of hemodialysis patients,

REFERENCES

- Alikari, V., Matziou, V., Tsironi, M., Theofilou, P., & Zyga, S. (2015). The Effect of Nursing Counseling on Improving Knowledge, Adherence to Treatment and Quality of Life of Patients Undergoing Hemodialysis. *International Journal of Caring Sciences*, 8(2), 514–518.
- Aria, Wahyuni, Imelda Rahmayunia Kartika, Imelda Firdausy Asrul, E. G. (2018). Korelasi Lama Hemodialisa Dengan Fungsi Kognitif. *REAL in*

- Nursing Journal (RNJ)*, 1(1), 1–8.
- Beerappa, H., & Chandrababu, R. (2018). Adherence to dietary and fluid restrictions among patients undergoing hemodialysis : An observational study, (August 2017). <https://doi.org/10.1016/j.cegh.2018.05.003>
- Hanum, R., Nurchayati, S., & Hasneli, Y. (2015). Pengaruh Pendidikan Kesehatan secara Individual tentang Pembatasan Asupan Cairan terhadap Pengetahuan tentang Pembatasan Cairan dan IDWG (Interdialytic Weight Gain) pada Pasien Hemodialisis. *Jom*, 2(2), 1427–1434.
- Johnson, S. B., & State, F. (2016). Medical Regimen Adherence, 3, 53–56. <https://doi.org/10.1016/B978-0-12-397045-9.00031-8>
- Jos, W. (2016). Kualitas Hidup Pasien yang Menjalani Hemodialisis Rutin. *Ejki*, 4(2), 87–91. <https://doi.org/10.23886/ejki.4.6283.87-91>
- Kahraman, et al. (2015). Impact of Interdialytic Weight Gain (IDWG) on Nutritional Parameters, Cardiovascular Risk Factors and Quality of Life in Hemodialysis Patients, 13(1), 25–33. <https://doi.org/10.1515/bj-2015-0006>
- Kartini Aprilia, Ismona, S. (2015). Analisis Faktor Yang Mempengaruhi Pembatasan Dit Cairan Pasien Chornic Kidney Disease Yang Menjalani Hemodialisa di RSUD Tugurejo Semarang. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699. <https://doi.org/10.1017/CBO9781107415324.004>
- Kozier, B., Erb, G., Berman, A., Snyder, S. J., Frandsen, G., Bruck, M., ... Stamler, L. L. (2018). *Fundamentals of Fundamentals of Canadian Nursing: Concepts, Process, and Practice* (Fourth Can, Vol. 4). United States of Canada: Pearson canada. Retrieved from <https://www.crcpress.com/Fundamentals-of-Picoscience/Sattler/p/book/9781466505094#googlePreviewContainer>
- LeMone, Pricilla, Karen M:Bauldoff, Gerene, Gubrud, P. (2017). *Medical-Surgical Nursing Critical Thinking for Person-Center Care* (3rd Editio, Vol. 1). Melbourne: Pearson australia Group Pty Ltd.
- Mahjubian, A., Bahraminejad, N., & Kamali, K. (2019). The Effects of Group Discussion Based Education on the Promotion of Self-Management Behaviors in Hemodialysis Patients. *Journal of Caring Sciences*, 7(4), 225–232. <https://doi.org/10.15171/jcs.2018.034>
- Makmor, T., Maryam, S., & Osman, A. F. (2018). Issues and Challenges of Public Health Accessibility Among Urban Poor People: A Case Study of Malaysia, Iran and India. *Malaysian Journal of Medical Research*, 2(4), 51–62. <https://doi.org/10.31674/mjmr.2018.v02i04>
- Mina, R. J. L., Lerma, M. A. B., Litan, P. L. B., Milano, A. A. L., Mojica, A. D. R., Malong-Consolacion, C. P., ... Torres, G. C. S. (2019). Fluid distribution timetable on adherence to fluid restriction of patients with end-stage renal disease undergoing haemodialysis: Single-blind, Randomized-Controlled Pilot Study. *Journal of Advanced Nursing*, 75(6),

1328–1337.

<https://doi.org/10.1111/jan.13964>

- Mousa, I., Ataba, R., Al-ali, K., Alkaiyat, A., & Zyoud, S. H. (2018). Dialysis-related factors affecting self-efficacy and quality of life in patients on haemodialysis: a cross-sectional study from Palestine. *Renal Replacement Therapy*, 4(1), 1–12. <https://doi.org/10.1186/s41100-018-0162-y>
- Nadi, H. I. K., Kurniawati, N. D., Maryanti, H., Program, M., Pendidikan, S., Keperawatan, F., ... Airlangga, U. (2015). Dukungan Sosial Dan Motivasi Berhubungan Dengan Kepatuhan Pembatasan Cairan Pada Pasien Penyakit Ginjal Kronik Yang Menjalani Hemodialisis, 8–14.
- Narva, A. S., Norton, J. M., & Boulware, L. E. (2016). Educating patients about CKD: The path to self-management and patient-centered care. *Clinical Journal of the American Society of Nephrology*, 11(4), 694–703. <https://doi.org/10.2215/CJN.07680715>
- Nayana, S. A., Balasubramanian, T., Nathaliya, P. M., Nimsha Hussain, P., Mohammed Salim, K. T., & Muhammed Lubab, P. (2017). A cross sectional study on assessment of health related quality of life among end stage renal disease patients undergoing hemodialysis. *Clinical Epidemiology and Global Health*, 5(3), 148–153. <https://doi.org/10.1016/j.cegh.2016.08.005>
- Pujiani1), M. (2017). Program Psikoedukasi Terhadap Peningkatan Kualitas Hidup Pasien Gagal Ginjal Kronik. *JURNAL EDUNursing*, [Http://Journal.Unipdu.Ac.Id](http://Journal.Unipdu.Ac.Id), 1(1), 47–56.
- Ramezani, T., Sharifirad, G., Gharlipour, Z., & Mohebi, S. (2019). Effect of Educational Intervention Based on Self-efficacy Theory on Adherence to Dietary and Fluids-intake Restriction in Hemodialysis Patients. *Health Education and Health Promotion*, 6(1), 31–38. <https://doi.org/10.29252/hehp.6.1.31>
- Saefulloh, M., & Nuraeni, W. (2016). Penerapan Edukasi Terstruktur Meningkatkan Self Efficacy Dan Menurunkan Idwg Pasien Hemodialisa Di Rsud Indramayu. *Pendidikan Keperawatan Indonesia*, 2(1).
- sitifia aisara, syaiful azmi, mefri yanni. (2015). Gambaran Klinis Penderita Penyakit Ginjal Kronik yang Menjalani Hemodialisis di RSUP Dr. M. Djamil Padang. *Kesehatan Andalas*, 7(1), 42–50. Retrieved from https://www.researchgate.net/publication/336803432_Gambaran_Klinis_Penderita_Penyakit_Ginjal_Kronik_yang_Menjalani_Hemodialisis_di_RSUP_Dr_M_Djamil_Padang
- Sousa, H., Ribeiro, O., Paúl, C., Costa, E., Miranda, V., Ribeiro, F., & Figueiredo, D. (2019). Social support and treatment adherence in patients with end-stage renal disease: A systematic review. *Seminars in Dialysis*, sdi.12831. <https://doi.org/10.1111/sdi.12831>
- Sri Suparti, U. S. (2016). Perbedaan Kualitas Hidup Pasien Gagal Ginjal Kronik Ditinjau Dari Tingkat Pendidikan, Frekuensi Dan Lama Hemodialisis Di RSUD Goeteng Taroenadibrata Purbalingga Sri, 14(2), 50–58.
- Tamaura, Y., Nishitani, M., Akamatsu, R., Tsunoda, N., Iwasawa, F., Fujiwara, K., ... Sakai, T. (2019). Association Between Interdialytic Weight Gain,

Perception About Dry Weight, and Dietary and Fluid Behaviors Based on Body Mass Index Among Patients on Hemodialysis. *Journal of Renal Nutrition*, 29(1), 24–32.e5. <https://doi.org/10.1053/j.jrn.2018.04.009>

Tamura, Y., Rd, M. S., Nishitani, M., Drph, R. A., Tsunoda, N., Rn, F. I., ... Sakai, T. (2019). Association Between Interdialytic Weight Gain and Dietary and Fluid Behaviors Based on Body Mas Index Among Patient on Hemodialysis. *Journal of Renal Nutrition*, 29(1), 24–32.e5. <https://doi.org/10.1053/j.jrn.2018.04.009>

Thomas, N. (2014). *Renal nursing. Nursing mirror* (Fourth Edi, Vol. 157). London: Wiley Blackwell.

Tzanakaki, E., Boudouri, V., Stavropoula, A., Stylianou, K., Rovithis, M., & Zidianakis, Z. (2014). Causes and complication of chronic kydney desease in patien on dialysis. *Health Science Journal*.

Wahyuni, E. D., Haloho, F. N. W., Asmoro, C. P., & Laili, N. R. (2019). Factors Affecting Interdialytic Weight Gain (IDWG) in Hemodialysis Patients with Precede-Proceed Theory Approach. *IOP Conference Series: Earth and Environmental Science*, 246(1), 0–7. <https://doi.org/10.1088/1755-1315/246/1/012034>