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Original Research

Fatigue Level Of Chronic Kidney Failure Patients After Undergoing Hemodialysis Therapy

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ABSTRACT

Background: *Chronic kidney failure is a terminal illness where the disease cannot be cured, so it requires hemodialysis therapy. Life changes in post-HD patients cause various complications that make patients feel uncomfortable, have insomnia, and feel dizzy and tired. Therefore, it is necessary to measure the level of fatigue using a post-dialysis fatigue scale to anticipate the exhaustion felt by the patient on the subsequent dialysis.*

Methods: *Quantitative research using PLS statistics, the population in this study consisted of 69 residents who had post HD and conducted on 59 samples with purposive sampling. Obtained the results of validity and reliability in the study, composite realiability= 0.902; rho_A= 0.895; discriminant validity=0.650. Collecting data using a questionnaire Post Dialysis Fatigue Scale (PDFS). The study was conducted in February 2022.*

Results: *The results showed that most respondents felt severe fatigue, as many as 44 people (74.6%) after undergoing hemodialysis therapy. The items that respondents felt most about fatigue levels included feeling dizzy, headache, no appetite, chest aches, and pains. In addition, the majority of respondents aged ≥50 years, 26 respondents (70.3%) felt severe fatigue. While the majority of respondents who underwent hemodialysis for ≥12 months, namely as many as 35 respondents (76.1%), felt extreme fatigue.*

Conclusion: *Most respondents were dominated by men with an average blood pressure of 140/88 mmHg and were in the category of severe fatigue.*

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INTRODUCTION

Chronic kidney failure (CKD) is a disease that causes the kidneys to decline to the point that they cannot function properly (Kundre, 2018). The prevalence of chronic renal failure in 2017 increased with the number of elderly. About 1/10 of the world's population suffers from CKD at a particular stage (Info DATIN, 2017).

Chronic renal failure cases, based on doctors' diagnoses in Central Java, ranked third with a total of 96,794 people in 2018 (Riskesdas,2018) (Health Research and Development Agency of Central Java Province, 2018). Patients with chronic renal failure need life-supporting treatment, namely kidney transplantation or treatment with hemodialysis (Ardhyanto et al., 2019). Hemodialysis is a very efficient treatment that can quickly eliminate uremic toxins and correct abnormalities in fluid status, electrolytes, and acid-base balance (Kooman et al., 2018).

In hemodialysis, kidney function is replaced by a device called a dialyzer, where dialyzer is a process that transfers blood-soluble substances into a dialysate or vice versa (Wiliyanarti & Muhith, 2019). The Indonesian population participating in HD therapy in 2017 consisted of 25,446 new and 52,835 old patients (Ministry of Health RI, 2018). The Indonesian Renal Registry (IRR) shows that in 2018, in Indonesia, there were 66,433 new hemodialysis patients, while active hemodialysis patients were recorded as many as 132,142 active patients (PERNEFRI, 2018).

Changes in the life of hemodialysis patients will cause various complications that make patients feel uncomfortable, experience anxiety, low situational self-esteem, impaired body image, and fatigue (Riski et al., 2019). Fatigue is a common symptom in kidney disease patients undergoing hemodialysis (Diana, 2020). The level of fatigue is relatively high in post-dialysis patients, with the results of Diana, (2020) showing that as many as three respondents (6.3%) felt mild fatigue, 13 respondents (27.1%) felt moderate fatigue, and 32 respondents (66.6%) felt severe fatigue after undergoing hemodialysis.

The results of a study by Maesyaroh et al., (2020) on 116 post-HD respondents experienced moderate fatigue (67%), followed by mild and severe fatigue (16.5%). Fatigue is linked to dialysis recovery time, with about a quarter of patients returning to the initial behavior within minutes after the dialysis is completed, a third recovering at home, and nearly a quarter recovering the following day (Diana, 2020). Fatigue after dialysis is influenced by several factors, including osmotic disequilibrium, blood membrane interactions, ultrafiltration, and diffusion (Kundre, 2018).

According to Kooman et al., (2018), osmotic equilibrium is a severe complication of post-hemodialysis. The signs and symptoms vary greatly, ranging from anxiety, fatigue, and headaches to coma and death. According to Shofaniah, (2018), ultrafiltration is a hemodialysis process to remove excess fluid from the blood, including non-profiling and profiling techniques; ultrafiltration affects the occurrence of hypotension in hemodialysis and fatigue in patients. Islamic hospitals in Indonesia have hemodialysis units, one of which is the Islamic Hospital (RSI) Sultan Agung Semarang.

The results of the preliminary study on November 22, 2021, at RSI Sultan Agung Semarang were obtained from the (RSISA Medical Record, 2021). In April-June 2021, there were 96 patients undergoing hemodialysis. Based on an interview with the head of the hemodialysis unit room Muchfid, (2021), it is known that currently, the patients who are recorded as regularly scheduled to perform hemodialysis in a month are 69 patients with an average per day hemodialysis unit of RSI Sultan Agung Semarang receiving around 20 patients who serve hemodialysis.

There are still differences in the results of research on the level of fatigue of chronic kidney failure patients after undergoing hemodialysis, and chronic kidney failure patients who undergo HD are increasing in Indonesia every year. According to the head of the HD

unit room Muchfid, (2021), it is known that there has been no previous research that uses the title of fatigue level after undergoing HD at RSI Sultan Agung Semarang. In earlier studies on the level of fatigue of post-HD patients using the Post-Dialysis Fatigue Scale instrument, there were no reliable test results on the Post-Dialysis Fatigue Scale instrument in Indonesian (Diana, 2020).

Therefore, an indicator of the success of HD patients in overcoming post-HD fatigue is to monitor fatigue levels and anticipate if post-HD patient fatigue occurs. From the above, it can be concluded that the nurse's role is indispensable in overcoming the fatigue of patients with chronic renal failure post-hemodialysis. Based on the background and results of previous studies, researchers are interested in researching "Fatigue Levels of Chronic Kidney Failure patients after undergoing Hemodialysis therapy at RSI Sultan Agung Semarang".

MATERIALS AND METHOD

The type of research used is descriptive analysis with a quantitative approach. The research site was carried out at RSI Sultan Agung Semarang. The population of patients undergoing hemodialysis was 69 residents. The sample to be used in this study was 59 respondents. The sampling technique is purposive sampling.

The inclusion criteria are as follows: chronic renal failure patients undergoing hemodialysis at RSI Sultan Agung Semarang, patients with compliments awareness, patients who are willing to become respondents by signing an informed consent sheet, and patients who can read and write. Exclusion criteria include patients undergoing incidental HD (not routine). The research instruments used in this study included observation sheets to record age, gender, last level of education, length of hemodialysis, dry weight, and blood pressure.

Post-dialysis fatigue Scale sheet to measure respondents' fatigue levels consisting of 13 negative statements using the Likert scale. On this Likert scale, strongly agree statements are rated (5), agree (4), disagree (3), disagree (2), and strongly disagree (1). In the study of Maesyaroh et al., (2020), it was stated that the level of fatigue experienced by hemodialysis patients was from mild to severe. So based on that the researcher made the following category of fatigue: mild fatigue = 13 – 30; Moderate Fatigue = 31 – 48; Severe Fatigue = 49 – 65.

The instrument of this study on validity and reliability tests using ten different respondents from the sample. Validity was measured using Pearson product-moment correlation, and reliability was measured using the alpha Cronbach technique Sugiyono, (2017). The PDFS instrument shows acceptable validity (r table = 0.632) and good validity results of this study (r result = 0.977) with high validity category. The reliability of PDFS with the consistency of acceptable intervals (r table = 0.60) and the reliability results of this study are good (r Cronbach's alpha = 0.970) with high-reliability categories. Obtained data on calculations using PLS statistics as follows, namely are (composite reliability = 0.902; rho A = 0.895; discriminant validity = 0.650).

The data collection method involves interviews, observations, and questionnaires. This research was conducted after obtaining ethical worthy from RSI Sultan Agung Semarang with ethics no. 21/KEPK-RSISA/II/2022. The flow of this study was that in the first period, demographic data was taken (including age, gender, the last level of education,

the duration of undergoing hemodialysis, dry weight, and blood pressure). Then, researchers helped respondents to complete a questionnaire from 13 statements that had been prepared.

Next, researchers re-examined the demographic questionnaire and the PDFS questionnaire if any were incompletely filled out. Finally, after the data was collected from all respondents, the researcher analyzed them. The analysis used in this study is the PLS statistic, which was presented in the form of frequency and percentage distributions of each variable. While the PDFS item is presented in the form of mean and standard deviation.

In PLS statistics obtained insignificant results between the PDFS questionnaire and the demographic data questionnaire with the results (f Square = 0.112; R Square = 0.101; Path coefficient = 0.317). The linear regression test found no significant difference between demographic data and PDFS questionnaires with results (sig. 0.506[b]), so this research used descriptive analysis.

RESULTS

Demographics of Respondents

Table 1 shows that most of the respondents' ages were ≥50 years, as many as 37 people (62.7%), with the average age of respondents being 51.81 years and a standard deviation of 9,52. In the gender category, most respondents were male, namely 38 people (64.4%). Meanwhile, there were 21 female respondents (35.6%). Finally, in the demographic data for the last level of education, respondents who had previous primary and high school education had the same number, namely 20 people (33.9%).

Based on the length of hemodialysis, most respondents underwent HD for ≥12 months, as many as 46 people (78%), with the average respondent undergoing HD for 31.10 months and a standard deviation of 24,32. In the dry weight category after hemodialysis, most of the respondents who achieved dry weight were 40 people (67.8%), with an average dry body weight of respondents of 65.97 kg and a standard deviation of 9.97.

Based on blood pressure, most respondents had a systolic between 131-160 mmHg, which was 28 people (47.5%) and most respondents had a diastolic between 70-80 mmHg, which was 25 people (42.4%). Therefore, the average systolic and diastolic respondents were obtained at 139.96/88.57 mmHg, with a standard deviation of 18.47 and a diastolic of 9.68.

Table 1. Distribution of frequency, percentage, average, and standard deviation of respondents' demographic data after undergoing hemodialysis in 2022 (n=59)

Demographics Data	f	%	Mean	SD
Age			51,81	9,52
17-27 years	2	3,4		
28-38 years old	4	6,8		
39-49 years old	16	27,1		
≥50 years	37	62,7		
Gender				
Man	38	64,4		
Woman	21	35,6		

Demographics Data	f	%	Mean	SD
Last Level of Education				
No school	3	5,1		
Primary School	20	33,9		
Junior High School	10	16,9		
Senior High School	20	33,9		
≥Bachelor	6	10,2		
Long time undergoing HD			31,10	24,32
<12 months	13	22		
≥12 months	46	78		
Dry weight			65,97	9,97
Reached	40	67,8		
Not achieved	19	32,2		
Blood pressure				
Systolic			139,96	18,47
100-130	25	42,4		
131-160	28	47,5		
161-190	6	10,2		
Diastolic			88,57	9,68
70-80	23	39		
81-90	15	25,4		
91-100	21	35,6		

Respondents' Fatigue Levels After Undergoing Hemodialysis

Table 2 shows that the respondent's fatigue level after undergoing hemodialysis was obtained on average with a score of 52.11, which means that the average respondent belongs to the category of severe fatigue and has a standard deviation of 6.92. Then as many as one respondents (1.7%) felt mild fatigue with an average score of 30. Furthermore, 14 respondents (23.7%) felt moderate fatigue with an average score of 43.42 and a standard deviation of 4,01. Meanwhile, 44 respondents (74.6%) felt severe fatigue with an average score of 55.38 and a standard deviation of 3.59.

Table 2. Average, standard deviation, frequency distribution, and percentage of respondents' fatigue scale after undergoing hemodialysis in 2022 (n=59)

Variable	f	%	Mean	SD
Respondents' fatigue levels			52.11	6,92
Mild Fatigue (13-30)	1	1,7	30	0
Moderate Fatigue (31-48)	14	23,7	43,42	4,01
Heavy Fatigue (49-65)	44	74,6	55,38	3,59
Total	59	100		

Table 3 shows that post-hemodialysis patients stated "Strongly Agree" feeling dizzy, averaging 4.91 (SD ± 0.89). Furthermore, it was found that post-hemodialysis patients said "Strongly agree" to feel headaches with an average of 4,83 (SD ± 0.94). Then on the no appetite item, respondents stated "Strongly Agree" with an average of 4,59 (SD ± 0.94).

Meanwhile, in the chest item, respondents said "Agree" with an average of 4.50 (SD ± 0.87). Finally, respondents stated "Agree" on the pain item with an average of 4.45 (SD ± 0.79).

Table 3. Average and standard deviation of post-dialysis fatigue Scale items in post-hemodialysis patients (n=59)

Item	Mean	SD	Information
Feeling exhausted	4,07	0,73	Agree
Body aches	4,08	0,83	Agree
Feeling tired and lethargic	4,20	0,88	Agree
Feeling dizzy	4,91	0,89	Strongly agree
I need to lie down and take a nap	4,28	0,74	Agree
It is difficult to move if you do not rest	4,34	0,82	Agree
No appetite	4,59	0,94	Strongly agree
Feeling a headache	4,83	0,94	Strongly agree
Chest pain	4,50	0,87	Agree
Feeling toothache	4,37	0,88	Agree
I don't want to move	4,15	0,88	Agree
Not motivated by anything	4,30	0,81	Agree
Feeling pain	4,45	0,79	Agree

Fatigue Levels Based on Demographic Data of Post Hemodialysis Patients

Based on table 4, it is known that 26 respondents aged ≥50 years old experienced severe fatigue (70.3%). In the gender category, male respondents who experienced extreme fatigue were 29 people (76.3%). Based on the last level of education, 15 respondents who graduated from elementary school experienced severe fatigue (75%). Meanwhile, when he graduated from high school, he experienced extreme fatigue as many as 17 people (85%). In the old category of undergoing hemodialysis, respondents who underwent hemodialysis ≥12 months experienced moderate fatigue as many as 11 people (23.9%) and severe fatigue as many as 35 people (76.1%).

Based on dry body weight, respondents with dry body weight achieved mild fatigue as many as one person (2.5%), moderate fatigue as many as ten people (25%), and severe fatigue as many as 29 people (72.5%). In the blood pressure category, respondents who had a systolic of 131-160 mmHg experienced mild fatigue in as many as one person (3.6%), moderate fatigue in as many as five people (17.9%), and severe fatigue in as many as 22 people (78.5%). Respondents with a diastolic of 81-90 mmHg experienced moderate fatigue in as many as four people (26.7%) and severe fatigue in as many as 11 people (73.3%).

Table 4. Distribution frequency and percentage of respondents' fatigue scale after undergoing hemodialysis based on respondents' demographic data in 2022 (n=59)

Respondents' Demographic Data	Respondents' Fatigue Levels Post HD					
	Mild		Moderate		Heavy	
	f	%	f	%	f	%
Age						
17-27 years	0	0	0	0	2	100

Respondents' Demographic Data	Respondents' Fatigue Levels Post HD					
	Mild		Moderate		Heavy	
	f	%	f	%	f	%
28-38 years old	0	0	0	0	4	100
39-49 years old	1	6,2	3	18,8	12	75
≥50 years	0	0	11	29,7	26	70,3
Gender						
Man	1	2,6	8	21,1	29	76,3
Woman	0	0	6	28,6	15	71,4
Last Level of Education						
No school	0	0	2	66,7	1	33,3
Primary School	0	0	5	25	15	75
Junior High School	0	0	4	40	6	60
Senior High School	1	5	2	10	17	85
≥ Bachelor	0	0	1	16,7	5	83,3
Long time undergoing HD						
<12 months	1	7,7	3	23,1	9	69,2
≥12 months	0	0	11	23,9	35	76,1
Dry weight						
Reached	1	2,5	10	25	29	72,5
Not achieved	0	0	4	21,1	15	78,9
Blood pressure						
Systolic						
100-130	0	0	7	28	18	72
131-160	1	3,6	5	17,9	22	78,5
161-190	0	0	2	33,3	4	66,7
Diastolic						
70-80	0	0	7	30,4	16	69,6
81-90	0	0	4	26,7	11	73,3
91-100	1	4,8	3	14,2	17	81

DISCUSSION

Based on the respondents' age, the majority were aged ≥50 years, namely 37 respondents (62.7%), with the average age of respondents being 51.81 years and a standard deviation of 9.52. This study's results align with the research Hartini, (2016) that the decline in kidney function on a small scale is average for every human being as he ages. This is supported by Endarti's, (2017) research, where age is a risk factor for chronic kidney failure. In chronic kidney failure disease, the risk increases with a person's age.

After the age of 50 years, kidney filtration will decrease. This decrease is predicted to be around 1% yearly (Centers for Disease Control and Prevention, 2019). The age above 50 years is an age that is very vulnerable to various diseases, including chronic kidney failure and complications that can worsen kidney function (Ismail, 2016). This study showed that the number of respondents was dominated by men, with 38 respondents (64.4%).

The results of this study align with Endarti, (2017), which states that most men also often experience systemic diseases (diabetes mellitus, hypertension, glomerulonephritis, polycystic kidney, and lupus) as well as a history of inherited family diseases. Man are more prone to suffer from chronic renal failure caused by lack of volume in the urine or excess compounds (natural compounds containing calcium consist of oxalate or phosphates and other compounds such as uric acid and amino acid cystine), the influence of hormones, physical state, and intensity of activity, narrower male urinary tracts make kidney stones become clogged more often (Hartini, 2016).

The lifestyle of men who have the habit of smoking and drinking alcohol can cause tension in the kidneys so that the kidneys work hard. Alcohol carcinogens filtered out of the body through the kidneys change DNA and damage kidney cells affecting kidney function (Ariani, 2016). Based on the latest level of education, this study's results showed similar results. Namely, 20 respondents (33.9%) were elementary and high school graduates who underwent hemodialysis.

The results of this study, supported by Barnet et al., (2007), showed that the level of education provides a difference in the ability to obtain information about chronic renal failure and inhibits patients from undergoing hemodialysis. This is corroborated by the research of Mollaoglu, (2009), patients with a high level of education have a good level of health examination awareness, while low-level patients are afraid of undergoing hemodialysis, so it is necessary to increase their knowledge about chronic renal failure.

In addition, the higher a person's education, the faster it will understand the disease suffered, and the lack of knowledge and awareness causes the patient to come with complaints that are already severe. At the follow-up time, the examination is already at the final stage (Hartini, 2016). The theory reinforces that chronic renal failure cases at stages 1 and 2 have not shown specific symptoms and complaints (Wibisono, 2014). Thus, patients with a low education level will tend to be at risk of suffering from chronic renal failure.

Based on the length of undergoing hemodialysis, the results of this study showed that the number of respondents who underwent hemodialysis was mostly for ≥12 months. Namely, 46 respondents (78%) with the average length of respondents undergoing HD was 31.10 months and a standard deviation of 24.32. Patients undergoing hemodialysis for more than two years are a normal category in undergoing HD. The longer the patient undergoes hemodialysis, the more likely to have a better condition than patients who have not undergone hemodialysis for a long time.

The long period of hemodialysis in chronic renal failure patients dramatically affects the patient's condition and condition both physically and psychically (Endarti, 2017). The longer the patient undergoes hemodialysis, the more obedient the patient is to undergo hemodialysis because usually, respondents have reached the stage of receiving plus they are also likely to get a lot of health education from nurses and doctors about the disease and the importance of carrying out hemodialysis regularly for them (Devi & Rahman, 2022). The results of this study are supported by Ardhyanto et al., (2019) that patients with chronic renal failure patients must be hemodialysis for life because chronic kidney disease (CKD) is a late-stage disease that requires life support treatment, namely hemodialysis (HD) or by performing a kidney transplant.

This study's results showed that respondents' average dry body weight was 65.97 kg and the standard deviation was 9.97 with dry body weight reached, which was 48 people

(67.8%). This study's results are expected because most respondents go the dry weight and have achieved BMI. The results of this study are supported by Daugirdar, (2015) research that as many as 28 respondents have gone dry body weight, but patients still feel lethargic after hemodialysis.

The results of this study are corroborated by the analysis of Bossola et al., (2018), who stated that dry weight is usually not accompanied by edema and dyspnea. However, hemodialysis therapy can potentially experience hypotension after dialysis due to high and fast ultrafiltration. Dedi, (2019) shows signs of dry weight reached, one of which is that blood pressure is within the normal range after undergoing hemodialysis or before the next hemodialysis session.

The results of this study showed that the average blood pressure of respondents was 139.96/88.57 mmHg with a standard deviation in systolic of 18,47 and diastolic of 9,68. The majority of respondents can be said to have high blood pressure, with an average blood pressure that exceeds the standard limit of 120/80 mmHg. The results of this study are corroborated by Tjekyan, (2012) states that, in general, kidney failure occurs due to progressive damage due to high pressure on the glomerular capillaries, blood will flow to the functional units of the kidneys, neurons will be disturbed, and can continue to be and die. With the destruction of the glomerular membrane, the protein will come out simultaneously with the urine, so the osmotic pressure of the colloidal plasma is reduced. This leads to edema that is often found in chronic hypertension.

Based on the theory from the research of Tjekyan, (2012), The kidneys control blood pressure by 1) If blood pressure increases, the kidneys will increase the production of salt and water, which will lead to a decrease in blood volume and return blood pressure to normal; 2) If the blood pressure decreases, the kidneys will reduce the removal of salts and water so that the blood volume increases and the blood pressure returns to normal; and 3) the kidneys can also increase blood pressure by producing an enzyme called renin, which triggers the formation of the hormone angiotensin, which will further trigger the release of the hormone aldosterone (Tjekyan, 2012).

Based on table 2, it was found that as many as 44 respondents (74.6%) felt severe fatigue, with an average score of respondents' fatigue level of 52.11 and a standard deviation of 6,92. The results of this study are in line with Diana, (2020) research conducted on 48 respondents, showing data that 32 respondents (66.7%) felt severe fatigue. Bossola et al. (2018) supported the results of this study, which showed that 164 out of 271 respondents experienced post-dialysis fatigue, of which 94 experienced severe fatigue.

This study is the same as the results of the research of Su Jeong Han, (2015) showed that patients undergoing hemodialysis had a high level of fatigue after hemodialysis. The percentage of patients who experienced fatigue after hemodialysis was 59.8%. Based on table 3, it is known that most post-HD patients feel a level of fatigue, including dizziness, headaches, not having an appetite, chest pain, and pain. Gifts of dizziness felt by hemodialysis patients are caused by blood flow that tries to compensate for the increased blood circulation along with the high and rapid ultrafiltration process (Nurhayati, 2018).

Complaints of headaches in post-hemodialysis patients are usually felt in the upper head area extending from the orbital to the back of the head (Senanayake, 2020). Chepalgia or headache is characterized by a charge such as being tied up, not throbbing, pain not centered at one point, occurring spontaneously, vertigo, and impaired concentration

(Kusuma, 2012). Chepalgia can cause disorders in post-hemodialysis patients, such as causing depression and anxiety until the patient's appetite decreases (Hidayati, 2016). The study results also have similarities with Siswani's (2018) study of 73 post-HD respondents. It was found that as many as 74% of the total respondents felt a loss of appetite accompanied by nausea, vomiting, and chest pain.

The majority of respondents aged ≥50 years, 26 respondents (70.3%) felt severe fatigue. The results of this study are in line with Diana, (2020) that most of the respondents aged >50 years, namely as many as 11 people (36.7%), experienced severe fatigue. In this study, it was corroborated by the research of Ardhyanto et al., (2019) stated that a person over the age of 50 years will experience a gradual decrease in the glomerular filtration rate until the elderly, the normal range is around 50% which results in the higher the age of the patient, the heavier the fatigue.

In this case, the results of the study have similarities with the research of Ismail, (2018). Age is related to the prognosis of the disease and life expectancy, so patients over 50 years old are prone to complications that worsen kidney function. Increased age causes a decrease in organ function, and the risk of fatigue increases. The results of this study showed that the number of respondents was dominated by men, reaching 38 respondents (64.4%).

This study is in line with the results of Maesaroh, (2019) that there is a relationship between sex and the onset of fatigue, meaning that when in conditions after hemodialysis, men are unable to manage their diet and rest compared to women and the majority of men still have jobs and become the backbone of the family, so that time to rest is reduced. Furthermore, based on the latest level of education, this study's results showed similar results, namely 20 respondents (33.9%) were elementary and high school graduates who underwent hemodialysis. Of the 20 respondents who graduated from elementary school, 15 (75%) felt severe fatigue. Meanwhile, of the 20 respondents who graduated from high school, 17 (85%) felt severely exhausted.

The results of this study are in line with the research of Sulistini et al., (2012) that there is no relationship between educational achievement and the onset of fatigue. Furthermore, this is in line with the results of Research by Sulistini et al., (2012), which states that there is a relationship between the length of hemodialysis and the level of fatigue, where patients experience an increase in fatigue by one month during the HD period. In this regard, the results of the study were also corroborated by the research of Bossola et al., (2018), showing the effects that as many as 104 fatigued patients had a longer recovery time and lower levels of ultrafiltration, as well as older age and a longer duration of hemodialysis.

Based on dry weight, more patients with dry body weight were achieved in this study. Of the 48 respondents (67.8%) with dry body weight reached, 29 people (72.5%) felt severe fatigue. Widiyanto, (2013) supports this study's results, where dry weight can be influenced by fluid input, thirst, self-efficacy, and fatigue. This is corroborated by Kamyar, (2009) study that patients with excessive fatigue will affect the body weight of post HD patients, characterized by loss of appetite in post-hemodialysis patients.

The results of this research are also supported by Daugirdar, (2015) study that fatigue in post-hemodialysis patients affects dry weight achieved or not, where dry body weight achieved will have heavier fatigue compared to dry body weight that is not gained. Based

on blood pressure, the results of this study were more post-hemodialysis patients with systolic (131-160) and diastolic (70-80) blood pressure, namely 28 people (47.5%) for systolic and as many as 23 people (39%) for diastolic. Of the 28 respondents with systolic blood pressure (131-160), 22 people (78.5%) felt severe fatigue.

Meanwhile, of the 23 respondents with diastolic blood pressure (70-80), 16 people (69.6%) felt extreme fatigue. This is corroborated by Potter, (2010) that several things can affect blood pressure in kidney failure patients, namely stress, anxiety, fear, pain, and fatigue, resulting in sympathetic stimulation that increases blood frequency, cardiac output, peripheral vascular resistance and the effect of sympathetic stimulation of increasing blood pressure.

CONCLUSION

The majority of fatigue experienced by respondents in this study included the category of severe fatigue in as many as 44 people (74.6%), and it was known that what the majority of post-HD patients felt at the level of fatigue included items of feeling dizzy, feeling headaches, no appetite, chest pain and feeling pain. Furthermore, at the age of patients ≥50 years, as many as 26 people (70.3%) felt severe fatigue, while the number of respondents who underwent hemodialysis was mostly for ≥12 months, namely as many as 35 respondents (76.1%) felt extreme fatigue.

Further research is expected to enhance this research by developing research on the Post Dialysis Fatigue Scale (PDF) by further multiplying variables such as (ureum levels, work, and hemoglobin levels) so that patients can use the results of the study to increase their knowledge in the story of fatigue that is deep in patients. And it is expected to be able to prepare and carry out continuous monitoring of fatigue levels in post-hemodialysis patients.

The results of this study are also likely to be used as a basis and reference in monitoring the status of fatigue experienced by post-hemodialysis patients. Nurses can involve patients in monitoring fatigue by creating solutions and scheduled action plans related to post-HD fatigue monitoring so that patients take an active role in monitoring their fatigue.

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