RELATIONSHIP BETWEEN ANEMIA AND THE QUALITY OF LIFE OF CLIENTS OF CHRONIC KIDNEY DISEASE UNDERGOING HEMODIALYSIS

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Abstract
Chronic kidney disease can cause various kinds of complications, and to prevent these complications, one of the treatment measures is done by hemodialysis. Clients who undergo hemodialysis are susceptible to emotional problems and thus have an impact on decreasing quality of life. The quality of life of clients of chronic kidney disease is influenced by psychosocial factors and clinical factors, one of which is anemia. Clients with severe and prolonged anemia will experience mental and physical fatigue, decreased exercise capacity, impaired cognitive function, decreased libido and lost sexual and appetite functions which can affect the quality of life of clients. Therefore this study aims to determine the relationship of anemia to the quality of life at clients of chronic kidney disease undergoing hemodialysis. The research method used was descriptive correlational with a cross-sectional approach. The sample of this study was 57 people using purposive sampling technique, with criteria for routine CKD clients and having undergone hemodialysis for more than 6 months, hemoglobin < 10 mg/dl, age > 18 years. Instruments for measuring quality of life using the WHO-QoL Bref questionnaire, and to determine anemia seen from Hb levels taken from medical records. Data were analyzed using Spearman Rank test. The results showed more than half (0.2%) had mild anemia and more than half (54.4%) had a high quality of life. The results of the Rank Spearman correlation test obtained a value of p = 0,000 so it can be concluded that there is a relationship between anemia and the quality of life of clients of chronic kidney disease undergoing hemodialysis. Therefore, it is expected that hospitals will continue to provide health education continuously, continue to provide varied types of food, and can facilitate the formation of associations of clients, families, and officers.

Keywords : anemia, quality of life, hemodialysis

1. INTRODUCTION

Chronic renal failure (CRF) is a condition in which progressive and irreversible kidney function decreases so that the body fails to maintain metabolism and fluid and electrolyte balance. This situation results in uremia and other nitrogenous waste in the body (Clevo & Margaret, 2012). The prevalence of CRF in the world undergoing hemodialysis in 2007 was 1.1 million people and increased to 2 million in 2012 (Diatrans Indonesia Kidney Foundation, 2012). Indonesia is a country with a high rate of CRF. In 2013 the number of CRF clients reached 15,128 people and those who actively underwent hemodialysis were 9,396 people, then in 2014 it became 17,193 people, and those who actively underwent hemodialysis were 11,689 people (IRR, 2014). While in West Java there are 5,029 new clients and 3,358 clients who are actively undergoing hemodialysis (IRR, 2014). Based on medical record data in Majalaya Regional Hospital, Bandung Regency, it was found that the number of patients with CRF also increased every year, namely in 2014 around 84 people and in 2015 as many as 105 people (Medical Records of RSUD Majalaya, 2015).

CRF can cause various kinds of complications. According to Smeltzer and Bare (2001), CRF complications consist of hyperkalemia, pericarditis, hypertension, anemia and bone disease. To prevent the occurrence of these complications, medical treatment is carried out on CRF clients consisting of conservative measures and dialysis or kidney transplantation (Price and Wilson,

2005). In Indonesia, the management of CRF clients which is most often done is replacement therapy. The most frequently used replacement therapy is hemodialysis, as much as 78% compared to other replacement therapies (Pernefri, 2012). Hemodialysis therapy will prevent death, although this therapy cannot cure or restore disease and is unable to compensate for the loss of metabolic or endocrine activity performed by the kidneys (Price and Wilson, 2007).

Hemodialysis is a procedure in which blood is removed from the patient's body and circulates in a machine outside the body called a dialyzer. The main goal of hemodialysis is controlling uremia, excess fluid, and electrolyte imbalances such as hyperkalemia and hyponatremia. The frequency of hemodialysis measures varies depending on how much kidney function is left, on average, patients with CRF undergo hemodialysis twice a week, while the duration of hemodialysis is at least three to four hours per therapy (Melo, Ribeiro, & Costa, 2015). Hemodialysis will be done for life when kidney function is permanently damaged (Setiawan & Faradila, 2012). Someone is often difficult to accept the fact that he has to undergo hemodialysis for life because of the expensive and inconvenient costs of having to come repeatedly in a week to make life uncomfortable (Alam & Hadibroto, 2007). Clients who undergo hemodialysis are also susceptible to emotional problems such as stress-related to diet and fluid restrictions, physical limitations, related illnesses, and drug side effects, and dependence on dialysis will have an impact on decreasing the quality of life of patients (Son, et. Al, 2009).

Hemodialysis carried out by clients can maintain survival while simultaneously changing the client's lifestyle (Ignatavicus & Workman, 2009). Clients who undergo hemodialysis experience various problems that arise as a result of kidney failure. This becomes a physical stressor that affects the decline in quality of life which includes physical, psychological, social relations, and environmental dimensions (Ginieri - Cocosis et al, 2008). The physical dimension includes the symptoms associated with the disease and the treatment taken for example malnutrition, anemia, and uremia. The psychological dimension is a psychological response in the form of anger, sadness, depression, and rejection by the client to protect himself. The dimensions of social relations include restrictions on social involvement related to interactions with the community and a decrease in sexual dysfunction. While the environmental dimension is related to the limitations of economic problems and the inability to provide financial resources.

According to Chan et al., 2011 the quality of life in CRF clients undergoing hemodialysis is influenced by psychosocial factors consisting of social activities, social support, depression, anxiety, self-esteem, anxiety, perception of disease, beliefs and clinical factors that consists of disease severity, treatment fulfillment, type and adequacy of dialysis, nutrition, and anemia. Of these various factors, anemia is the most dominant factor that occurs in GGK clients with a percentage of 80-90%.

The anemia prevalence in CRF clients according to WHO (2011) is 84.5% with prevalence in hemodialysis clients being 100% and 73.1% in predialysis clients. If the hemoglobin (Hb) level of less than 10 g / dL is used as a minimum value, the prevalence of anemia in hemodialysis clients is 96.2% and 30.8% in predialysis. In America, according to URDS data (2010) the incidence of anemia in stage 1 - 4 CRF is 51.8% with average Hb levels in GGK clients 9.9 g / dL. In Indonesia, there are no epidemiological data on anemia in CRF that are national (Pernefri, 2011).

Anemia experienced by CRF clients undergoing hemodialysis is caused by several factors including a decrease in erythropoietin production, blood loss during the dialysis process, dietary restrictions on therapy, occult blood loss, increased for bleeding, frequent blood collection for laboratory tests. Functionally anemia is defined as a decrease in the number of erythrocytes so that

it cannot fulfill its function to carry sufficient amounts of oxygen to peripheral tissue. The loss of red blood cells in the dialyzer membrane amounts to 0.5 - 11.0 ml in one hemodialysis (0.5 - 11.0 mg iron), on average 5 ml of red blood cells (5 mg iron), so for one year will lose iron more than 1200 mg, more than all iron reserves in the body (Bandiara, 2003).

Clients with severe and prolonged anemia show mental and physical fatigue decreased exercise capacity, impaired cognitive function, decreased libido and lost sexual and appetite functions which can affect the quality of life of clients. Anemia plays a role in increased morbidity and mortality, low quality of life in CRF clients, and accelerating the client's progress towards terminal kidney failure. The risk of morbidity and mortality can be reduced if the client is in a good state while undergoing hemodialysis therapy (Rakhmayanti, 2011).

2.Materials and methods

The research design used in this study was descriptive correlational with the Cross-Sectional approach. The population in this study were all CRF clients who underwent routine hemodialysis every week twice in Majalaya General Hospital in the Period 8 August 2016 - 31 January 2017 as many as 742 people with an average number of clients 123 people each month. A sample of 57 clients was taken by purposive sampling, which is sampling based on certain considerations such as the nature of the population or characteristics that have been previously known (Notoadmodjo, 2010). Criteria for the sample used were CRF clients who underwent routine hemodialysis, age> 18 years, Hb <10 gr / dL, duration of hemodialysis for more than 6 months.

The instrument used to measure the quality of life was the Quality Of Life (WHOQOL-BREF) questionnaire and for the anemia variable, researchers looked at the results of Hb from CRF client medical records. Data collection is done by examining the Medical Record of clients who come to undergo hemodialysis to find out the client's history of anemia or not within the past 6 months, then the researcher provides a quality of life questionnaire to be filled by the client. After completion, the data were analyzed using Rank Spearman correlation analysis.

3.Results and Discussions

a. Frequency Distribution of Anemia in CRF Clients Who Underwent Hemodialysis in Majalaya General Hospital

Table 1
Frequency Distribution of Anemia in CRF Clients Who Underwent Hemodialysis in Majalaya General Hospital

Anemia	Total	Percentage (%)
Mild	40	70,2
Medium	12	21,1
Severe	5	8,8
ATotal	**57**	**100**

Based on the table above, it was found that more than half of CRF clients undergoing hemodialysis in Majalaya General Hospital (70.2%) had mild anemia.CRF clients who undergo hemodialysis all experience anemia even with varying degrees.The reasons for CRF clients

undergoing hemodialysis in Majalaya General Hospital mostly experience mild anemia with a percentage of 70.2% because clients consume foods that have high levels of iron in accordance with the advice of officers, then the hospital also provides snacks in the form of cakes that can be consumed when the hemodialysis process runs even though sometimes the client declares boredom with a less varied menu. Also, CRF clients also received injections of erythropoietin hormones for clients with hemoglobin levels of ≥7 and those with ≤10 with the frequency of administration once a week.

Factors that cause anemia in CRF clients undergoing hemodialysis are due to blood loss that occurs due to platelet dysfunction. The occurrence of blood loss during the hemodialysis process reaches 3-5 grams of iron per year, whereas normally we lose iron from 1 to 2 mg per day, so what happens to CRF clients who undergo hemodialysis experiences blood loss of 10-20 times more than normal. Blood loss can also be caused by gastrointestinal bleeding, and hematuria (Bandiara, 2003).

Another factor of anemia also occurs because shortening the life span of erythrocytes decreases by about one-third of normal erythrocyte age. This is due to the occurrence of hemolysis. Besides that, the occurrence of erythropoietin deficiency is the main cause of anemia. The researchers said that peritubular cells that produce erythropoietin are partially or completely damaged along with the progression of kidney disease, so that erythropoietin production is not as low as its anesthetic degree (Bandiara, 2003).

b. Frequency Distribution of Quality of Life in CRF Clients Who Underwent Hemodialysis in Majalaya Hospital

Table 2
Frequency Distribution of Quality of Life in CRF Clients Who Underwent Hemodialysis in Majalaya General Hospital

Quality of Life	Total	Percentage (%)
Low	26	45,6
High	31	54,4
A Total	**57**	**100**

Based on the table above, it was found that more than half of CRF clients undergoing hemodialysis in Majalaya General Hospital (54.4%) had a high quality of life.

Table 3
Frequency Distribution of Quality of Life in CRF Clients Who Underwent Hemodialysis in Majalaya Hospital Based on Domain of Physical, Psychological, Social, and Environmental Health

Domain	Quality of Life	Total	Percentage (%)
Physical Health	Low	27	47,4
	High	30	52,6
Psychological	Low	27	47,4
	High	30	52,6
Social	Low	27	47,4
	High	30	52,6
Environmental	Low	25	43,9
	High	32	56,1

Based on the table above, it was found that more than half of CRF clients undergoing hemodialysis in Majalaya General Hospital (52.6%) had a high quality of life in the domain of physical health, psychological, social relations. And it was also obtained that more than half of CRF clients undergoing hemodialysis in Majalaya General Hospital (56.1%) had a high quality of life in the environmental domain. The four sub-variables of quality of life are affected by anemia and are related to one another, cannot be separated so that no domain is the most important or not important in its implementation. Therefore, if there is an inconsistency from one sub variable, there will be an imbalance in achieving a better quality of life for CRF clients.

The highest quality of life for physical health domain points is in questionnaire number 17, namely that CRF clients express satisfaction with the ability to display activities in daily life. The reason for the satisfaction of the GGK client is because the client is a housewife or someone who has not worked who is not required by his partner to carry out activities that exceed his ability. The client is given the freedom to do or not carry out activities by following the physical condition he feels. Whereas the lowest point on this physical domain is found in questionnaire number 10 which states that the client does not have enough vitality for daily activities. This is caused by physical fatigue caused by anemia experienced by CRF clients because one of them is the process of hemolysis. Therefore CRF clients do not carry out various activities that deplete the body's vitality. Clients only carry out certain activities that are tailored to their respective physical abilities.

The results of the above study indicate conformity with the theory put forward by Tallis (2005) which states that CRF clients undergoing hemodialysis will experience physical changes that are not only limited to the kidney system, but other body systems are also affected which can lead to decreased health status and quality of life. According to Farida (2010), the quality of life is physically decreased due to weakness, decreased the physical response, easily tired, and due to limitations in fluid and nutritional intake and lack of sleep. Therefore CRF clients undergoing hemodialysis adapt to coping with reduced physical health by limiting physical activity such as not doing heavy work, limiting the intake of fluids and nutrients as recommended based on their health.

On the highest quality of life, the psychological health domain points are on questionnaire number 26 which states that the client does not feel hopeless, anxious, and depressed. This is because the CRF client has full support from the family. When the client feels family discomfort is

the first person to give enthusiasm in living life. Seeing the results of the above research, this breaks the theory put forward by Tallis (2005) which states that psychological response in the form of depression is the most common psychological response. Anger and rejection occur by clients to protect themselves and emotions that are often uncontrollable. This can have a negative effect that can cause a decrease in client compliance with treatment and reduce effective communication between clients and health workers.

The CRF client undergoing hemodialysis at Majalaya General Hospital stated that the client had accepted this CRF with submission to God Almighty as a test of faith. People with chronic renal failure will experience changes in spirituality by getting closer to God than before getting renal failure and undergoing hemodialysis. Getting closer to God is done by practicing religious rules and not doing things that are prohibited by religion. Think more about life for the afterlife. The quality of life spiritually is felt to increase by way of getting closer to God and doing good (Farida, 2010).

The lowest point on this psychological domain is found in questionnaire number 2 which states that CRF clients undergoing hemodialysis are not satisfied with the health they feel. The thing that makes them dissatisfied is because they have to routinely do a week of hemodialysis to the hospital, and also due to this CRF illness, the client must limit their daily food and drink intake. The results of the above study indicate harmony with the theory put forward by Alam & Hadibroto (2007) which states that it is difficult for a person to accept the fact that he must undergo hemodialysis for life. In addition to the cost of being expensive and troublesome because they have to come repeatedly in a week, making life uncomfortable. Clients who undergo hemodialysis are also susceptible to emotional problems such as stress-related to diet and fluid restrictions, physical limitations, related illnesses, and drug side effects, and dependence on dialysis will have an impact on the decline in the quality of life of clients (Son et al., 2009).

The highest quality of life for social relations domain points is in questionnaire number 22, which states that clients are satisfied with the support obtained from friends. This can be seen from the support of people around the place of residence, they always support to always be eager to undergo hemodialysis. Although in reality clients themselves sometimes feel bored undergoing hemodialysis. According to Sheri and Rodmacher (1992), social support is a resource provided through interaction with others. Or it can be concluded that social support is the availability of resources that provide physical, and psychological comfort obtained through the knowledge that the individual is loved, cared for, valued by others and he is also a member of a group based on mutual interests.

While the lowest quality of life for the social domain points is in questionnaire number 21 which states that CRF clients undergoing hemodialysis experience dissatisfaction in sexual life. The client said that since experiencing CRF and undergoing hemodialysis the client had not had sexual relations with his partner, the main reason being that the client had impotence and those female clients had frigidity. Sexual dysfunction occurs in late CRF clients with hemodialysis. In CRF clients, generally get antidepressant therapy, where this drug can reduce libido and delay orgasm in women, reduce erection and ejaculation in men. In addition to depressant factors, other things that contribute to sexual dysfunction are body image, zinc deficiency and hormonal disorders (Diaz et al.2006).

On the quality of life of the environmental domain, the highest point is in questionnaire number 24, which states that the client is satisfied with access to health services. The reason for this satisfaction is because to do hemodialysis the client does not need to travel far out of town

because access to health services is close to a place to stay that is easy to reach. While the lowest point is in questionnaire number 12 which states that the client does not have enough money to meet his needs. This is due to the inability of clients to work to make money because of limited physical activity.

According to Sekarwiri (2008), it is said that the main stressors are those related to economic problems and the inability to get money, including financial resources, freedom, physical safety and security, health care and social care, home environment, opportunity to obtain new information and skills, participation and opportunities to carry out recreational or fun activities, physical environment, and transportation.

c. Relationship between anemia and the quality of life of clients Chronic kidney failure undergoing hemodialysis

Table 4
Relationship between Anemia and Quality of Life in CRF Clients Who Underwent Hemodialysis in Majalaya General Hospital

Variable	r	value
Anemia between Quality of Life	-0.541	0.000

Based on the calculation results obtained a significance value (0,000) <0.05, which means that there is a significant relationship between anemia and the quality of life of clients of Chronic Kidney Failure undergoing hemodialysis in RSUD Majalaya. The negative correlation coefficient of -0.541 indicates that the more severe the anemia, the lower the quality of life, and vice versa, the lighter the anemia, the higher the quality of life. Chronic kidney disease is progressive and continuous destruction of kidney structure. CRF can arise from almost all comorbidities, progressive deterioration of kidney function will be characterized by a progressive decrease in glomerular filtration rate (LFG) (Corwin, 2009). The Kidney Disease Outcomes Quality Initiative (K / DOQI) of the National Kidney Foundation (NKF) in 2009, defined CRF as kidney damage where the value of the GFR was less than 60 ml/min/1.73m2 for three months or more.

CRF who starts needing dialysis is chronic kidney disease which has decreased kidney function with glomerular filtration rate (LFG) <15 mL/minute. In this situation, it has decreased so much that there is an accumulation of toxins in the body called uremia. In the condition of uremia, renal replacement therapy is needed to take over kidney function in eliminating body toxins so that no more severe symptoms occur (Cahyaningsih, 2008). And to prevent complications, medical treatment is carried out on CRF clients consisting of conservative measures and dialysis or kidney transplantation (Price and Wilson, 2005).

Hemodialysis therapy will prevent death, however, this therapy cannot cure or restore disease and is unable to compensate for the loss of metabolic or endocrine activity performed by the kidneys (Price and Wilson, 2007). The frequency of hemodialysis measures varies depending on how much kidney function is left, on average, patients with CRF undergo hemodialysis twice a week, while the duration of hemodialysis is at least three to four hours per therapy (Melo, Ribeiro, & Costa, 2015).

It is difficult for someone to accept the fact that he has to undergo hemodialysis for life. In addition to the cost of being expensive and troublesome because they have to come repeatedly in a week to make life uncomfortable (Alam & Hadibroto, 2007). CRF clients also suffer from anemia.

Anemia experienced by CRF clients undergoing hemodialysis is caused by several factors including a decrease in erythropoietin production, blood loss during the dialysis process, dietary restrictions on therapy, occult blood loss, increased for bleeding, frequent blood collection for laboratory tests. Functionally anemia is defined as a decrease in the number of erythrocytes so that it cannot fulfill its function to carry sufficient amounts of oxygen to peripheral tissue. The loss of red blood cells in the dialyzer membrane is 0.5 - 11.0 ml in one hemodialysis (0.5 - 11.0 mg iron), on average 5 ml red blood cells (5 mg iron), so for one year will lose iron more than 1200 mg, more than all iron reserves in the body (Bandiara, 2003).

Clients with severe and prolonged anemia show mental and physical fatigue decreased exercise capacity, impaired cognitive function, decreased libido and lost sexual and appetite functions which can affect the quality of life of clients. Clients who undergo hemodialysis are also susceptible to emotional problems such as stress-related to diet and fluid restrictions, physical limitations, related illnesses, and drug side effects, and dependence on dialysis will have an impact on decreasing the quality of life of patients (Son, et. Al, 2009).

Hemodialysis carried out by clients can maintain survival while simultaneously changing the client's lifestyle (Ignatavicus & Workman, 2009). Clients who undergo hemodialysis experience various problems that arise as a result of kidney failure. This becomes a physical stressor that affects the decline in quality of life which includes physical, psychological, social relations, and environmental dimensions (Ginieri - Cocosis et al, 2008). The physical dimension includes the symptoms associated with the disease and the treatment taken for example malnutrition, anemia, and uremia. The psychological dimension is a psychological response in the form of anger, sadness, depression, and rejection by the client to protect himself. The dimensions of social relations include restrictions on social involvement related to interactions with the community and a decrease in sexual dysfunction. While the environmental dimension is related to the limitations of economic problems and the inability to provide financial resources. Thus the results of this study support the theory put forward by Chan et al. 2011 which states that the quality of life in CRF clients undergoing hemodialysis is influenced by psychosocial factors consisting of social activity, social support, depression, anxiety, self-esteem, anxiety, perceptions of disease, beliefs and clinical factors which consist of disease severity, treatment fulfillment, type and adequacy of dialysis, nutrition, and anemia.

4. CONCLUSION

Based on the results of the research that has been done, it can be concluded as follows:

a. More than half of CRF clients who undergo hemodialysis experience mild anemia.
b. More than half of CRF clients who undergo hemodialysis have a high quality of life.
c. There is a relationship between anemia and the quality of life of CRF clients undergoing hemodialysis, where the lighter the anemia, the higher the quality of life, and vice versa, the more severe anemia, the lower the quality of life.

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