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THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND QUALITY OF LIFE IN CHRONIC KIDNEY FAILURE PATIENTS UNDERGOING HEMODIALYSIS

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ABSTRACT
Patients undergoing hemodialysis often report lower quality of life. Many factors cause this decline, and physical exercise is one of them. Doing physical activity helps patients live a better life. This study aimed to analyze the relationship between physical activity and the quality of life of CKD patients undergoing hemodialysis at Pandan Arang Hospital, Boyolali. This research method uses a descriptive correlative design with a cross-sectional approach. The sample of this study consisted of 121 respondents selected using accidental random sampling techniques. Data were collected using the WHOQOL-BREF questionnaire to measure quality of life and IPAQ to measure physical activity, and bivariate test data analysis was performed using the Spearman statistical test. With a significance of alpha = 0.05. The results showed that most patients had high levels of physical activity (69.4%) and high quality of life (66.1%). Physical activity and quality of life were significantly correlated (p-value <0.001), meaning patients' quality of life improved with increased physical activity. A good correlation exists between the quality of life and the physical activity level of hemodialysis patients with chronic kidney disease. Therefore, therapy that emphasizes enhancing the patient's physical activity is strongly advised as part of comprehensive care to improve the quality of life for patients receiving hemodialysis. Health workers should support rehabilitation and physical education programs to achieve the best results.

Keywords: chronic renal failure; hemodialysis; physical activity; quality of life

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INTRODUCTION

Chronic kidney failure, a disease whose prevalence is rising worldwide, impacts the quality of life of patients undergoing treatments like hemodialysis. Physical activity has been demonstrated to impact hemodialysis patients' quality of life and enhance their functional capacities compared to those who do not engage in physical activity, making it one of the factors contributing to a decline in quality of life. (Samsu, 2024) Hemodialysis patients often show a marked decrease in quality of life. Several factors contribute to this decline, including low levels of physical activity, usually associated with comorbid conditions such as diabetes, cardiovascular disease, and hypertension. These conditions limit the functional capacity of patients to engage in physical activity, which worsens their quality of life. (Wu et al., 2022). According to a study conducted in Taiwan on 120 HD patients, the quality of life was higher for people with moderate physical activity than for those with little activity. The improvement in their physical and mental well-being was positively correlated with physical activity for 30 minutes five times a week. This implies that treatments that promote physical activity can help hemodialysis patients live better lives. (Wu et al., 2022)

Chronic kidney disease (CKD) is a growing global health problem. Uremia and azotemia are symptoms of chronic kidney failure, a persistent and permanent decline in kidney function caused by the body's inability to maintain fluid, electrolyte, and metabolic balance. (Inayati et

al., 2021). The two most common treatments for chronic kidney failure are hemodialysis and transplantation. Hemodialysis is a kidney replacement procedure that removes waste and toxins from the body when the kidneys are not functioning correctly. Hemodialysis is performed two to three times a week and takes four to five hours. (Efendi Zulfan et al; 2020). One of the kidney replacement treatments is hemodialysis. Patients can experience medical and psychological problems due to prolonged hemodialysis treatment. (Wijayanti et all., 2016). Patients' lives can be improved, and their chances of survival increased with hemodialysis. (Nurcahyati, 2016). Kidneys that are damaged and unable to filter blood adequately are known as chronic kidney disease.This can cause the body to retain too much water and waste products in circulation. This, among other health problems, can lead to heart disease or stroke. (Centers for Disease Control and Prevention, 2022). Chronic kidney disease is a persistent abnormality in kidney structure or function, such as a glomerular filtration rate (GFR) of 30 mg/24 hours for over three months. Chronic kidney disease is most often associated with diabetes and hypertension in developed countries. (Chen et al., 2019).

According to data from the World Health Organization (WHO), chronic kidney disease claims the lives of 850,000 people each year. According to the data, this disease is the 12th leading cause of death worldwide. This disease ranked eighth in America in 2019, with 131,008 deaths overall, and there were 254,028 deaths nationwide. Men are more likely to die from chronic kidney disease than women, with 131,008 deaths in men and 123,020 deaths in women. (PAHO, 2021). According to PENEFRI (2018), from 2007 to 2018, 132,142 people in Indonesia were actively undergoing hemodialysis treatment, and 66,433 new patients were undergoing hemodialysis. The number of new hemodialysis patients increased to 35,602 in 2018 and continues to grow yearly. In 2018, cardiovascular problems accounted for 42% of all deaths, making it the most common complication. Based on statistical data from Riskesdas 2013-2018, an estimated 3.8% of the Indonesian population suffers from chronic kidney disease (CKD) based on medical diagnosis. The highest prevalence is in North Kalimantan (6.4%), followed by North Maluku (6.3%), North Sulawesi, Gorontalo, Central Sulawesi, and West Nusa Tenggara (6.2%). The lowest prevalence is in Aceh, West Java, Maluku, DKI Jakarta, Bali, and DIY Yogyakarta (each 6.1%). (Mohammad Yakob, Fatma Siti Fatimah, 2018).

The comparison between expectations and reality determines a person's quality of life. The standard of care provided to individuals with chronic kidney failure is reflected in their quality of life. Many social, psychological, and physical systems are involved in care. Patients with chronic kidney failure will better understand their condition and take part in their care if they are informed about their quality of life. (Lisa Lolowang, Lumi, and Rattoe, 2021). Patients with chronic kidney failure undergoing hemodialysis benefit from physical activity. Hemodialysis patients have lower physical activity levels, which can impair health-related quality of life. This suggests that lack of physical activity, such as exercise, can affect quality of life. (Fukushima et al., 2018).

According to the findings of an initial study on 175 patients with chronic kidney failure receiving hemodialysis at Pandan Arang Boyolali Hospital, while some patients' quality of life declined due to their inactivity, other patients' quality of life increased because they were still able to engage in physical activity. Hemodialysis patients with chronic kidney failure must thus receive the proper care to improve their functional ability and quality of life by increasing their level of physical activity. As stated in the above description, the researcher wishes to look at the relationship between physical activity and hemodialysis patients' quality of life in chronic kidney failure cases. This study aims to determine whether physical activity and the quality of life of hemodialysis patients with chronic kidney failure at Pandan Arang

Boyolali Hospital are related. Patients with chronic kidney failure experience health issues that impact their physical, mental, social, and environmental well-being. In this instance, exercise is significant in managing the disease's detrimental effects on the body and mind.

This study's primary goal was to assess the degree to which patients' levels of physical activity impact aspects of their quality of life, including their functional capability, mental health, social relationships, and capacity to carry out daily tasks.This study suggests improved care management and intervention strategies and assesses if patients' physical activity levels impact their physical and mental health. In addition to offering fresh perspectives on the connection between physical activity and quality of life, the findings of this study should also serve as a foundation for initiatives aimed at enhancing medical care for those suffering from chronic renal failure. It is anticipated that the results of this study will benefit patients, their families, and the healthcare system overall in the long run, particularly by fostering a more patient-centered and holistic approach to treatment.

METHOD

This research method uses a descriptive correlative design with a cross-sectional approach. The sample of this study consisted of 121 patients selected using the accidental random sampling technique. The location of this research was Pandan Arang Boyolali Hospital in September-October 2024. The population of patients undergoing hemodialysis at Pandan Arang Boyolali Hospital was 175 people. The sample of this study consisted of 121 patients selected using the accidental random sampling technique. Two questionnaires, the IPAQ questionnaire, which measured physical activity, and the WHOQOL-BREF questionnaire, which measured quality of life, were distributed to collect data. The WHO Quality of Life-BREF (WHOQOL-BREF) and the International Physical Activity Questionnaire (IPAQ) were employed as research tools. IPAQ has good reliability (test-retest reliability 0.70–0.95) and moderate to high validity (r = 0.30–0.50). The WHOQOL-BREF is a good tool for assessing patients' physical activity and quality of life because of its strong validity (r = 0.50–0.90) and high reliability (Cronbach's alpha > 0.70). This study uses two methods in data analysis; researchers use univariate analysis to describe the characteristics of each research variable separately. Bivariate analysis to test the relationship between 2 variables using the Spearman test, the significance value of alpha = 0.05. This research has also received ethical clearance from the Health Research Ethics Committee of the Faculty of Health Sciences, Muhammadiyah University of Surakarta, with letter number No. 1984.1/A.3-III/FIK/VIII/2024.

RESULT

The frequency distribution of all variables, including respondent characteristics such as age, gender, education, occupation, duration of hemodialysis, physical activity, and quality of life, can be explained by univariate analysis. The following are the findings of the study:

Based on table 1 shows the age distribution of chronic kidney failure patients undergoing hemodialysis; many are in the adult to elderly age group. The majority of patients are in the age range of 46-55 years (26.4%) and 56-65 years (24.8%), with the age of over 65 years reaching the same percentage (24.8%). Patients undergoing hemodialysis are primarily male (52.1%). Patients with education levels show that some patients have a high school education (37.2%). A total of 67 respondents (55.4%) were included in the analysis of patients whose jobs were included in the other category. Then, 62.8% of patients have undergone hemodialysis for over a year. In addition, 37.2% of people have undergone hemodialysis for less than one year.

Table 1.
Frequency Distribution of Respondent Characteristics

Characteristics	f	%
Age		
17 - 25 years	2	1,7
26 - 35 years	8	6,6
36 - 45 years	19	15,7
46 - 55 years	32	26,4
56 - 65 years	30	24,8
>65 years	30	24,8
Gender		
Men	63	52,1
Female	58	47,9
Education		
Elementary school	33	27,3
Junior high school	22	18,2
Senior high school	45	37,2
D3/S1/S2/S3	21	17,4
Work		
Civil Servant	6	5
Private Employed	15	12,4
Self Employed	32	26,4
Army/Police	1	0,8
Others	67	55,4
Hemodialysis Duration		
< 1 Tahun	45	37,2
> 1 Tahun	76	62,8

Table 2.
Frequency Distribution of Respondents Physical Activities

Physical Activity	F	%
Low	8	6,6
Medium	29	24
High	84	69,4

Table 2 distribution of patient physical activity, the majority of patients (69.4%) have high physical activity, 24% of patients do moderate physical activity, and 6.6% of patients are included in the low group. This shows that the majority of patients do quite heavy physical exercise.

Table 3.
Frequency Distribution of Respondents Quality of Life

Quality of Life	F	%
Low	7	5,8
Medium	34	28,1
High	80	66,1

Table 3 shows that most patients have a high quality of life (66.1%) and a moderate quality of life (28.1%), and only 5.8% feel they have a low quality of life. The relationship between physical activity and quality of life is shown in the following table.

Tabel 4.
Relationship between Physical Activity and Quality of Life

Physical Activity	Quality of Life							P Value
	Low		Medium		High		Total	
	f	%	F	%		%		
Low	3	37,5	4	50	1	12,5	8	< 0,001
Medium	4	13,8	9	31	16	55,2	29	
High	0	0	21	25	63	75	84	

Table 4 illustrates how patients' quality of life varies according to their physical activity level. Most respondents (75%) have high levels of physical activity and quality of life. The level of physical activity and quality of life are strongly correlated, according to the significant relationship found (p-value <0.001). The higher the physical activity of patients, the higher the likelihood they have a better quality of life.

DISCUSSION

The study results showed that most patients were in the age range of 46-55 years. They are showing that chronic kidney failure and the need for hemodialysis are more common in older age groups. According to Brunner & Suddarth in Kusniawati (2018), glomerular filtration performance will decrease progressively by 50% between 40-70 years old. In addition to reduced fluid intake, a risk factor for kidney failure or injury, the capacity of the renal tubules to absorb and concentrate urine also decreases, making it more difficult to empty the bladder and the possibility of infection and blockage increases. Men make up the majority of hemodialysis patients, whereas women make up a smaller percentage. This indicates that men are more likely than women to experience chronic renal failure. According to earlier research, lifestyle and hormonal variables make males more prone to chronic kidney failure. Environmental and lifestyle variables, such as smoking and alcohol use, increase the risk of end-stage renal disease or a 50% reduction in glomerular filtration rate (eGFR) in males compared to women. (2020, Neugarten). Chronic kidney disease is more common in men than in women, and persistent smokers are seven times more likely to acquire chronic kidney disease. This is also because women contain the hormone estrogen, which regulates calcium levels and can disrupt oxalate absorption, resulting in kidney stones and chronic kidney failure. Vehvilainen-Julkunen, Theodora, and Sapountzi Krepia (2017).

The study results showed that most hemodialysis patients with chronic kidney disease had a high school and elementary school education level. These results indicate that the education of patients tends to be low. According to research (Komariyah et al., 2024), people with primary education are less able to understand information and health problems, which can lead to chronic diseases such as chronic kidney disease. Respondents with low education experience limitations in managing chronic diseases and obtaining access to health. This is by (Aditya, 2023) that patients with higher education have a broader understanding and are more accustomed to more complex knowledge, such as fluid restrictions in patients with chronic kidney failure, and this affects patient behaviour, one of which is in terms of fluid restrictions in chronic failure.This study showed that most respondents had jobs such as labourers, farmers, traders, and retirees. Employment and money can impact a person's quality of life because they enable them to meet their basic necessities. A lack of funds can discourage someone from seeking therapy because of financial constraints (Notoadmodjo, 2012). Chronic kidney disease patients will see a reduction in their quality of life as their illness worsens, making it harder for them to balance their finances and keep a job (Rustandi, Tranado & Pranasti, 2018).

The duration of patients undergoing hemodialysis treatment was mostly >1 year. This shows that the majority of patients have undergone hemodialysis >1 year. According to previous researchers (Permata Sari et al., 2022), representing the study's results, a relationship was found between the duration of hemodialysis and the quality of life of chronic kidney failure patients with a p-value of 0.001. Hemodialysis patients experience psychological stress. The duration of hemodialysis treatment shows that patients who receive hemodialysis treatment for more than 1 year have a higher quality of life than patients who receive hemodialysis for approximately two months. Currently, the patient has reached the stage of hemodialysis and has felt the benefits because the longer the hemodialysis, the more confident. Factors that influence this stressor include limiting fluid intake, limiting food intake, limiting activities, sleep disturbances, and disturbances. According to health facilities, these conditions make patients unproductive. Therefore, it affects the patient's quality of life. Quality of life is a subjective sensation felt by each individual. Patients undergoing long-term HD increasingly understand the importance of adhering to HD and the benefits of regular HD practice. HD's duration becomes more extended when they feel their disease's impact. Most of their lives. Not undergoing hemodialysis affects the patient's quality of life (World Health Organization Quality of Life) (WHOQOL-BREF, 2012).

According to the study's findings, most patients engaged in high levels of physical activity (69.4%), moderate levels (24%), and low levels (6.6%).This shows that the majority of patients have high levels of physical activity. This physical activity can affect the patient's quality of life,; the higher the physical activity, the higher the patient's quality of life. This is in line with research (Battaglia et al., 2024). Physical activity is essential in primary prevention in the general population and secondary and tertiary prevention for patients with chronic kidney failure. Lack of physical activity causes decreased physical function, exercise tolerance, muscle mass and strength, and cardiovascular fitness, increasing the risk of fatigue, weakness, and depression. According to (Zhang et al., 2022), lack of physical activity in hemodialysis patients and a lifestyle with little physical activity are the causes of high mortality rates; this can also affect the disease. Therefore, further action is needed to increase the physical activity of hemodialysis patients.

The quality of life of chronic kidney failure patients is mostly high; the rest are patients with moderate quality of life and a few patients with low quality of life. According to (Mohanraj et al., 2022), Factors that can affect the quality of life of hemodialysis patients include place of residence, gender, economic factors, duration of hemodialysis, stress, depression, and implementation of self-care. Prior research has demonstrated that several significant factors impact hemodialysis patients' quality of life. First, patients' quality of life and capacity to perform daily tasks are significantly affected by the underlying illness, which is chronic renal failure. Diabetes and hypertension are examples of comorbid diseases that exacerbate a patient's health, raise the risk of complications, and lower their quality of life. Furthermore, maintaining the patient's quality of life requires effective medical management, which includes proper hemodialysis management. Lastly, patients may find it challenging to regularly adhere to the therapy program due to the distance from the medical institution, which may impact their general health. (Galaresa, 2023)

This study's findings show a relationship between physical activity and the quality of life of hemodialysis patients; the Spearman correlation test yielded a p-value = <0.001 smaller than α 0.05, indicating that Ho is rejected and Ha is accepted. This study is by (Fukushima et al., 2018). This study observed the functional capacity of hemodialysis patients because, in hemodialysis patients, functional capacity is reduced, which affects the patient's quality of life. This activity is a recommendation to reduce impaired quality of life. This study

concluded that patients who were actively involved in physical activity showed a better quality of life than patients who were less active in physical activity. From the Spearman correlation test, it can be concluded that good physical activity contributes to quality of life. In his study (Filipčič et al., 2021Revealed that hemodialysis patients had an increased risk of dying because they had lower MAS and AAS scores. Hemodialysis patients have a lower quality of life than people in general, so it is essential to form physical activity habits to achieve a good quality of life. According to (Wu et al., 2022), The quality of life of hemodialysis patients who do moderate activities is better than patients who rarely do physical activity. Comorbidities can worsen the patient's primary disease and impact general health, affecting the patient's physical function and survival. Physical activity benefits patients with chronic kidney failure; regular physical activity can improve physical function, muscle tension and strength, and patient quality of life. Exercise can also improve physical function, stabilize cognitive function, reduce the risk of disease severity, and improve patients' quality of life with chronic kidney failure. According to (Filipčič et al., 2021), The study's findings demonstrated a relationship between hemodialysis patients' quality of life and physical activity. This study supports and expands on earlier research showing that hemodialysis patients had worse quality of life and physical activity habits than healthy controls. Among the factors examined, it was also demonstrated that hemodialysis patients' physical activity patterns were a more accurate indicator of their quality of life than those of healthy controls. Thus, hemodialysis patients benefit significantly from programs promoting physical activity, particularly regarding their quality of life and general well-being. Support from health workers in the form of education and physical rehabilitation programs is essential to achieve optimal results.

CONCLUSION

According to statistics, most patients are between 46 and 55 years old. This shows that the elderly are more likely to experience chronic kidney failure and require hemodialysis. Compared to men, there are fewer women, who comprise the majority. This indicates that chronic kidney failure is more common in men than in women. Most chronic kidney failure patients receiving hemodialysis are less educated than a high school graduate. Most of them have completed elementary and high school. These results show that the education of patients still needs to be higher. Most hemodialysis patients work as labourers, farmers, traders, and retirees. The duration of patients undergoing hemodialysis treatment is mostly >1 year. This shows that most patients have mostly undergone hemodialysis >1 year. Patients undergoing long-term HD increasingly understand the importance of compliance and the benefits of doing HD regularly. When they feel the impact of the disease, the duration of HD becomes a significant part of their lives.Research findings show a strong correlation between the quality of life of hemodialysis patients and physical activity. Patients with higher levels of physical exercise generally have a higher quality of life than those with lower physical activity levels. Physical activity has been demonstrated to be crucial for improving the quality of life for hemodialysis patients by lowering fatigue, boosting muscle strength, and enhancing mental health. Therefore, as part of comprehensive care to enhance the quality of life for patients with chronic renal failure receiving hemodialysis, interventions aimed at improving physical activity in patients are strongly advised. Support from health workers in the form of education and physical rehabilitation programs is essential to achieve optimal results.

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