

Original Research Paper

Sleep quality among chronic kidney disease patients undergoing hemodialysis: a cross-sectional study

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Abstract

Chronic kidney disease (CKD) is a terminal condition with high morbidity and mortality. Hemodialysis is one intervention of the end stage of CKD patients. It is impair sleep quality and affect on physical and mental health of the patient, which results in individual daily activities. The purpose of the study to determine the the sleep quality among CKD patients undergoing hemodialysis. This study used a cross-sectional design. The sampling technique used was purposive sampling. A total of 45 CKD patients undergoing hemodialysis participated in the study. Pittsburgh Sleep Quality Index (PSQI) questionnaire was used to measure the quality of sleep among CKD patients. Frequency distribution was used to analyze the result. The results of the study showed the quality of sleep among CKD patients undergoing hemodialysis was poor. Family and healthcare provider support and attention are needed to improve patient quality of sleep. Thus the patient can survive.

Keywords: chronic kidney disease; hemodialysis; sleep quality

1. Introduction

Chronic Kidney Disease (CKD) is defined by the damaged condition of the kidney or presence decreased function of the kidney for at least three months (Levey et al., 2020). This progressive condition affects more than 10% general population and become a noncommunicable disease that causes of death worldwide (Kovesdy, 2022). Based on the International Society of Nephrology (ISN), more than 850 million people suffer from kidney disease and increasing every year, among them 10.4% in men and 11.8% in women, worldwide (Vos & Boris, 2020). Based on data from RISKESDAS (Basic Health Research) in 2018, the number of CKD sufferers increases every year. Data on the prevalence of chronic kidney disease based on medical diagnoses in Indonesia is 3.8% or an increase of 1.8% compared to the previous year (Riskesdas, 2018). Moreover, the incidence of CKD in Central Java in 2018, based on a medical diagnosis in the population aged >15 years, was 0.42%, whereas in 2013, the incidence of CKD was 0.3%; this indicates an increase in the incidence of CKD. The prevalence of CKD increases with increasing age (Health, 2018).

CKD in the late stages requires a kidney transplantation or renal replacement therapy through regular hemodialysis (HD) or peritoneal dialysis (PD) to maintain the body function for survival (Alshammari et al., 2019). Furthermore, Alshammari et al. (2019) state that patients receiving HD experience a significant burden; one of them is sleep disturbance, which is the most prevalent among CKD patients and affects the sleep quality of hemodialysis patients. Inadequate sleep and poor sleep quality, if not handled properly, can cause two disturbances, namely, physiological and psychological balance. Physiological effects include decreased daily activities, feeling tired and weak, a decreased immune system, and unstable vital signs. Psychological effects include depression, anxiety, and lack of concentration (Hall et al., 2020). Poor sleep quality will have a significant negative impact on health in the long term so that it has an impact on changes in the quality of life of CKD patients. Poor sleep

quality also results in the patient's condition taking longer to improve, which extends the treatment period.

A previous study reported that the majority of CKD patients undergoing hemodialysis have poor sleep quality (94.3%) (Indrarini et al., 2019). On the contrary, another study showed that only a few respondents had poor sleep (36.4%) (Alshammari et al., 2023). Based on previous results, the researcher are interested in conducting the study.

2. Research Methods

Descriptive research with a cross-sectional design was used in this study. This study was conducted to obtain the sleep quality among CKD patients undergoing hemodialysis at Fatimah Islamic Hospital, Cilacap. The sample in this study was calculated based on quota sampling with the number of respondents was 46. However, 1 patient refused to continue the study then the number of respondents in this study was 45. 45 respondents with inclusion criteria of respondent were CKD patients undergoing hemodialysis, both men and women patients, patient who were willing to be respondents, aged at least 20 years old and able to orient properly included in this research. Whereas the exclusion criteria were patients who did not want to sign informed consent and patients who received sleeping pills. The instruments used were a general patient information instrument and a Pittsburgh Sleep Index Quality (PSQI) instrument. The validity and reliability of the instrument were tested. The construct validity was used to check the validity and yielded r count $>$ r table, which means the instrument is valid. Then Cronbach Alpha indicates reliability coefficient value ≥ 0.7 . The data were analyzed using frequency distribution to describe the quality of sleep among CKD patients undergoing hemodialysis. This research has been declared ethical by the Health Research Ethics Committee of Aisyiyah University Yogyakarta in accordance with the Certificate of Ethical Ethics number 1974/KEP-UNISA/II/2022.

3. Result and Discussion

The respondent characteristics are summarized in Table 1. The majority of the respondents were female, although the numbers are only slightly different from male respondents with preponderance the age of 46-65 years old. The majority of respondents did not have sedentary behavior of smoking and drinking coffee. Most of the patients have a length of hemodialysis of 1-24 months and live in a quiet environment. More than half of the respondent have mild activity in their daily life with their education degree majority were in primary school. Based on Table 2. It was shown that more than half of respondents have poor sleep quality.

Table 1. Respondent Characteristics

No	Characteristic	Respondent	
		N	%
1.	Gender		
	Male	22	48.8
	Female	23	51.1
2.	Age (years)		
	20-25	2	4.44
	26-35	5	11.1
	36-45	9	20
	46-55	13	28.8
	56-65	13	28.8
	> 65	3	6.6
3.	Life style		
	Coffee	10	22.2

No	Characteristic	Respondent	
		N	%
4.	Smoke	2	4.4
	Coffee and smoking	3	6.6
	Not both	30	66.6
	Length of Hemodialysis (month)		
	1-24	28	62.2
	25-48	8	17.7
	49-72	5	11.1
	>72	4	8.8
5.	Environment		
	Noisy	4	8.8
	Vehicle sound	5	11.1
	No noise	36	80
6.	Activity		
	mild	29	64.4
	Medium	8	17.7
	Heavy	8	17.7
7.	Education degree		
	Primary School	30	66.6
	Junior High School	7	15.5
	Senior High School	5	11.1
	Bachelor	1	2.2
	Not receiving education	2	4.4

Source: Primary Data, 2022

Table 2. The Sleep Quality among CKD Patients Undergoing Hemodialysis

Sleep Quality	Respondent	
	N	%
Good	18	40
Poor	27	60

Source: Primary Data, 2022

3.1.Characteristics of the Respondent

There was a slightly different proportion between male and female respondents in this study. However, prior studies found that male patients have a greater number of developing Chronic Kidney Disease (CKD) due to dominant hormon in man (Indrarini et al., 2019). Moreover, Alifah Indrarini, Anggri Noorana Zahra & Yona (2019) explained that the testosterone hormone affects the mechanism of apoptopsis the cell that plays an important role in the development of glomerulosclerosis and CKD. However, This is also in line with research conducted by Hill et al (2016) regarding the Global prevalence of Chronic Kidney Disease, A systematic review, and meta-analysis found that CKD is more common in women than men (Hill et al., 2016). The reason is that women than men, in general, have less muscle mass and muscle mass is a leading determinant concentration of serum creatinine.

Regarding age, most of the respondents were at age 46-65 years old. Respondents aged over 45 years and above were associated with a risk of decreased kidney function. At this age, changes in kidney function are due to increasing age. In the age over 40 years, there is a progressive decrease in Glomerular Filtration Rate (GFR) until the age of 70 years, approximately 50% of normal (Devi & Rahman, 2022). That reason might show that the number of CKD patients at this age is high.

3.2. Quality of Sleep among Chronic Kidney Disease Patients Undergoing Hemodialysis

The present study found that more than half (60%) of respondents had poor sleep quality. It represented the majority of respondents have poor sleep quality and similarly with the prior study (Adejumo et al., 2023; Indrarini et al., 2019; Ralli et al., 2022). The possible reason for the result is perhaps due to the age of the participants majority at 46-65 years old which categorized as pre-elderly and elderly according World Health Organization (WHO, 2016). A previous study found that CKD patients undergoing hemodialysis who were aged more than 50 had poorer sleep than those who were younger (Alshammari et al., 2023). This might be caused by aging associated with physiological changes and a variety of extrinsic factors. For example, as they age people's sleep architecture changes due to a decrease in deep sleep and a higher portion of lighter sleep stages. With regard to gender, in present study showed that there was no immense amount between males and females and this is confirmed by previous research showing that no significant difference in the prevalence of both males and females on poor sleep quality (Ralli et al., 2022).

Respondent activities were associated with sleep disturbance and specifically the patients who did physical exercise had a good quality of sleep and a better quality of life. It was found in the present study that, the majority of the respondents have mild activity. Consistent with prior study Theodorou, et al. (2020), activity affects the patient's quality of sleep. Dialysis is an approach to end-stage CKD therapy that engages the patient staying in the hemodialysis unit for hours daily and then is expected to affect the patient's ability to do physical activity. Whereas, exercise in patients with sleep disorders, may reduce the apnea-hypopnea index, improve the sleep quality during daily physical activity, and may have a protective role in disease progression (Theodorou et al., 2020). In relation to CKD condition, the contributor factors of poor sleep disorder might be due to uremia, restless legs syndrome, and metabolic factors (Nigam et al., 2018), and psychological factors (Adejumo et al., 2023).

Poor sleep quality among CKD patients undergoing hemodialysis diminish quality of life immensely (Alshammari et al., 2023). Particularly participation of patients in daily activities, social relationships, and well-being sense may be badly disturbing. This can cause feelings of dissatisfaction, powerlessness, and degraded patient independence. An intervention can be a recommendation to overcome poor sleep quality among CKD patients and exercise interventions can be one of the alternative interventions to help improve sleep quality in patients with CKD (Fan Zhang et al., 2022) in line with the result of the present study. In addition, relaxation is also reported to help improve patients with CKD sleep quality. Among others are progressive muscle relaxation, nurse-led breathing training, mindfulness, and the Benson relaxation technique (Natale P et al., 2019)

4. Conclusion

Chronic kidney disease is a disease that has a thorough impact on patients' daily lives. One of them is patients experience poor sleep quality. Moreover, activity and age can be possible explanations for the study result.

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