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Characteristics of patients undergoing hemodialysis during Covid-19 pandemic[☆]

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Abstract

Objective: This study aimed to explore the characteristics of hemodialysis patients during the COVID-19 pandemic.

Method: This descriptive study employed a cross-sectional approach using 30 participants purposively selected from two hemodialysis centers in Riau Province, Indonesia. A personal information form and observation sheets were used for data collection. This study was conducted in May and June 2020. Distribution frequency and Pearson Correlation tests were applied during analysis.

Results: A total of 16 (53.3%) patients were female, and most respondents (90%) were married. In addition, the predominant occupation was employees (40%), and the majority has graduated from Senior High School (43.3%). The Mean, Median, and Standard Deviation (SD) of age were 49.9, 50.5, and 11.24. These parameters were respectively 37.88, 29.5, and 34.06 months for the duration from the first dialysis, while 2.04, 2, and 0.24 were correspondingly reported in terms of dialysis adequacy. The Mean, Median, and SD of Inter-dialytic weight gain were 2.25, 2.61, and 0.65, respectively. A correlation was established between age and IDWG (*p* value = 0.047) with *r* score = −0.50, and also between IDWD and dialysis adequacy (*p* value = 0.014) at *r* score = −0.60.

Conclusion: The study identified the need for nurses to carefully consider IDWG and dialysis adequacy while caring for hemodialysis patients. This approach is expected to facilitating survival during the COVID-19 pandemic.

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Introduction

Coronavirus disease 2019 (Covid-19) is a sickness instigated by the coronavirus. This disease is known to disrupt the respiratory system and potentially cause death. The incidence case originated in Wuhan, China, in December 2019 and has spread rapidly worldwide. Furthermore, the World Health Organization (WHO) declared the Covid-19 a pandemic on March 12, 2020,[1] as the number of positive cases continuously increases in numerous countries, including in Indonesia. The statistics were estimated at 47,428,888 cases worldwide, with 1,213,224 deaths, while 418,375 cases and 14,146 deaths were reported in Indonesia.[2]

The coronavirus disease negatively impacted the world, including patients participating in hemodialysis therapy. In addition, the pandemic instilled apprehension in sufferers about visiting the treatment center, especially at the beginning. Hence, there was an increase in the risk of death, resulting from low body immunity and the new and complicated procedure devised to prevent the spread of covid-19 within the hemodialysis centers. Based on the predictions, thousands of sufferers threatened death in Indonesia due to the pandemic.

Dialysis adequacy and Interdialytic Weight Gain (IDWG) are two essential indicators in hemodialysis patients. Dialysis adequacy is used to predict whether patients obtain adequate hemodialysis doses to achieve the expected results of undergoing hemodialysis.[3] IDWG is an increased body fluid volume reflected by increasing body weight during the interdialytic period.[4] Adequacy and IDWG affect the quality of life of hemodialysis patients. Due to the Covid-19 pandemic, dialysis adequacy and IDWG may be affected significantly since the patients are afraid to undergo hemodialysis in the hospital. It causes dialysis adequacy is not achieved, and IDWG will increase uncontrolled. Before the Covid-19 pandemic, the adequacy and IWDG can be relatively controlled since the patients can undergo hemodialysis routinely and support from nurses and their families.[5]

The previous studies focused more on the characteristics of hemodialysis patients with COVID-19,[6–9] impacts of drug trials on sufferers comorbid with COVID-19,[10] and related case reports,[11,12] or other qualitative studies.[13,14] However, there is minimal information on the characteristics of patients scheduled for hemodialysis in Indonesia during the Covid-19 pandemic in the aspect of possible limitations and induced challenges. This research, therefore, aims to investigate the characteristics of hemodialysis patients in Riau Province, Indonesia, during the Covid-19 pandemic.

Method

The study design was quantitative with a cross-sectional approach. This study involved 30 hemodialysis patients recruited purposively from two treatment centers in Riau Province, Indonesia. In addition, personal information forms were used to collect information on patient characteristics, while data on hemodialysis adequacy and Inter-dialytic weight gain were obtained using observation sheets.

The dialysis adequacy in this research was estimated using the Kt/V formula. ''K'' denotes dialyzer clearance and reflects the blood flow rate through the apparatus.

Table 1 Categorical values of baseline characteristics ($n = 30$).

Characteristics	Frequency	Percentage
Gender		
Male	14	46.7
Female	16	53.3
Marital status		
Married	27	90
Unmarried	3	10
Last education		
Elementary school	4	13.3
Junior high school	8	26.7
Senior high school	13	43.3
University	5	16.7
Religion		
Moslem	30	100
Non-Moslem	0	0
Occupation		
Government officer	4	13.3
Employee	12	40
Entrepreneur	3	10
Housewife	7	23.4
Unemployed	4	13.3

At the same time, ''t'' signifies the time of a dialysis session and ''V'' for the volume of water in a patient's body.[3] Furthermore, Interdialytic Gain was measured by subtracting a previous session's post-dialysis weight from the current pre-dialysis measurement. The data were collected in May and June 2020 and consequently analyzed using distribution frequency and Pearson test. The ethical clearance for this study was obtained from the Ethics Committee, Faculty of Nursing, Riau University, Indonesia number 44/UN.19.5.1.8/KEPK.FKp/2020.

Results

The results showed the patients consisted of 14 males (46.7%) and 16 females (53.3%), and majority (90%) were married. In addition, the predominant occupation and education level were employees (40%) and graduated from Senior High School (43.3%). The Mean, Median, and Standard Deviation (SD) for patient age were 49.9, 50.5, and 11.24 years old. The corresponding values for the duration from the first hemodialysis were 37.88, 29.5, and 34.06 months. In terms of dialysis adequacy, 2.04, 2, and 0.24 were estimated, while 2.25, 2.61, and 0.65 were respectively recorded for Inter-dialytic weight gain. Tables 1 and 2 show details relating to the category of baseline characteristics.

Furthermore, data on age, duration from the first hemodialysis, dialysis adequacy, and IDWG were normally distributed with a *p*-value of 0.28, 0.10, 0.33, and 0.06, respectively (Table 3).

A correlational analysis was performed on the numerical data, and the results showed an inverse association between age and IDWG (*p* value = 0.047) with *r* score = −0.50. Also,

Table 2 Numerical values of baseline characteristics (n = 30).

Characteristics	Mean	Median	SD	95% CI	p value
Age	49.9	50.5	11.24	43.95–55.93	0.28
Length of undergoing HD	37.88	29.5	34.06	19.72–56.03	0.10
Dialysis adequacy	2.04	2.00	0.24	1.91–2.08	0.33
Inter-dialytic weight gain (IDWG)	2.25	2.61	0.65	1.90–2.60	0.06

Table 3 Correlational analysis of numerical values of the characteristics (n = 30).

Characteristics	Age	Length of undergoing HD	Adequacy	IDWG
Age		p = 0.699	p = 0.337	p = 0.047 r = −0.50
Length of undergoing HD	p = 0.699		p = 0.398	p = 0.709
HD adequacy	p = 0.337	p = 0.398		p = 0.014 r = −0.60
IDWG	p = 0.047 r = −0.504	p = 0.709	p = 0.014 r = −0.60	

there was an inversely proportional correlation between IDWD and dialysis adequacy (p value = 0.014) with r score = −0.60.

Discussion

This study showed a mean patient age in the middle age (49.9 years old), while the average duration from the first-time hemodialysis was 37.88 months or above three years. In addition, several previous studies have acknowledged similar patient profiles.[4,10,15,16] Therefore, those on treatment for a longer time are assumed to have better discipline in observing the schedule, despite some impending obstacles. This disposition resulted from the benefits perceived from participating in therapy sessions.[17]

The mean value of hemodialysis adequacy recorded was 2.04, where KDOQI (2015) suggested 1.2 twice a week.[18] Therefore, the outcome of this investigation was higher than the recommendation. However, the minimum level acceptable in various countries, using Kt/V estimates, was 1.5 in Egypt, 1.8 in Thailand, and 1.9 in Spain. Therefore, a 0.1 increase is associated with a reduced risk of mortality from cardiovascular, cerebrovascular, and infectious diseases. Moreover, dialysis inadequacy is associated with a more extended hospital stay, and higher medical costs,[3] while the inverse denotes effective patient hemodialysis.[19]

The mean IDWG reported in this study was 2.25 kg. Previous research has shown values below 5% or about 2–3.5 kg to be an acceptable range for hemodialysis patients.[20] The results also showed an inversely proportional correlation between age and IDWG. This is congruent with a study where IDWG reflects salts and water intake and is possibly adopted as a parameter to evaluate fluid intake. Furthermore, this factor is also associated with pre-dialysis blood pressure and as an indicator of nutritional status.[18]

This study revealed the existence of an inverse proportional correlation between IDWG and dialysis adequacy. The result is different from a previous study, where no relationship was established. The discrepancy was possibly attributed to variations in body weight, the hemodialysis machine characteristics, blood and dialysate speed, and length of hemodialysis session for each patient.[5] These dissimilarities possibly influence dialysis adequacy and further impact the patient's quality of life. However, it is essential for nurses to carefully consider these differences to ensure adequate care provision. This approach is significant, particularly during the Covid-19 pandemic, which is responsible for numerous challenges and limitations. Furthermore, these potential problems are assumed to affect hemodialysis patients in any aspect of life, both economically and socially, and consequently influence the individual's health status.

Conclusion

In this study, the characteristics of patients were 16 (53.3%) females with a predominant married population at 90%. In addition, the most common occupation and education level was an employee (40%) and graduated from Senior High School (43.3%). The mean age duration from the first hemodialysis and IDWG were 49.9 years old, 37.88 months, and 2.25, respectively, with average dialysis adequacy of 2.04. Moreover, an inverse correlation was established between age and IDWG (p value = 0.047) and between IDWD and dialysis adequacy (p value = 0.014). Hence, nurses are required to regularly assess the IDWG parameter and dialysis adequacy of hemodialysis patients. This study is an attempt to maintain patient quality of life during the Covid-19 pandemic adequately.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

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