Available *online* at : http://ejurnal.stikesprimanusantara.ac.id/

Jurnal Kesehatan

| ISSN (Print) 2085-7098 | ISSN (Online) 2657-1366 |

Research

Analysis of Factors Associated with Hemodialysis Patient Compliance During the Covid-19 Pandemic

Rahma Hidayati [1], Agus Citra Demawan[2] , Elfira Husna[3], Evi Susanti[4], Yuhendri Putra[5]

[1,2] *Akademi Keperawatan Bina Insan Jakarta, DKI Jakarta, Indonesia*
[3,4,5] *Universitas Prima Nusantara Bukittinggi, West Sumatera,, Indonesia*

ARTICLE INFORMATION

Received: January 26, 2023
Revised: January 30, 2023
Accepted: February 26, 2023
Available online: March 30, 2023

KEYWORDS

Compliance; Hemodialysis; Pandemic-Covid-19

CORRESPONDING AUTHOR

Rahma Hidayati

E-mail: rahmahidayati@akperbinainsan.ac.id

A B S T R A K

Background: Undergoing hemodialysis during the pandemic has become a polemic for patients with kidney failure. As one of the groups at risk and susceptible to exposure, concerns about being exposed to the virus and the consequences if not undergoing hemodialysis are difficult choices. For each dialysis session, the patient must be in contact with many people in one room for 4-5 hours. In addition, their travel to and from the hospital, also increase the chance of being exposed to Covid-19. The uncertainty and low predictability of COVID-19 have an impact on patient adherence to hemodialysis. Meanwhile, patients who do not perform routine hemodialysis are also at risk for various complications, decreasing quality of life and the threat of death.
Aims: the purpose of this research was to identify the factors related to patient compliances with hemodialysis therapy during the pandemic Covid-19.
Methods : This research was a descriptive analytic using a cross sectional design. Number of samples involving 97 people was taken by a technique. Data was collected using a questionnaire and analyzed with multivariate statistics.
Results: 52.6% of respondents did not comply with the hemodialysis schedule. The factors related to the non-adherence were education level (p = 0.003), anxiety level (p = 0.002), ease of access to health services (p = 0.00) and family support (p = 0.00).
Conclusion: This research concluded that ease of access to health services **was** the main predictor of patient adherence to hemodialysis during the pandemic Covid-19.

INTRODUCTION

Hemodialysis is a replacement therapy that patients with chronic renal failure must undergo. The goal of hemodialysis treatment is to purge the blood of metabolic waste, eliminate uremic pollutants, and maintain fluid and electrolyte balance. Patients undergo this treatment routinely, twice or thrice per week, in hospitals and specialized dialysis clinics. During the Covid-19 pandemic, the hemodialysis service system was modified. Patients undergoing routine hemodialysis are extremely susceptible to Covid-19 infection. This is as a result of the group's minimal resistance (immunospressants). As a member of one of the groups at risk and susceptible to exposure, it is challenging to decide whether to comply with the hemodialysis therapy schedule or delay it. This is due to the fear of being exposed to the virus, particularly when the patient must spend 4-5 hours per dialysis session in a room with a large number of people. Additionally, their travel to and from the facility increases their likelihood of exposure to Covid-19 (Kliger et al, 2020).

DOI: http://dx.doi.org/10.35730/jk.v14i1.940

Jurnal Kesehatan is licensed under CC BY-SA 4.0
© Jurnal Kesehatan

Patients' adherence to hemodialysis therapy will be impacted by patient worries and the low predictability of Covid-19. Patients who do not undergo routine hemodialysis run the risk of developing a variety of complications, including physical disorders, diminished quality of life, psychological disorders, and threats to their lives. One missed dialysis session per month is associated with a 30% increase in the risk of mortality and re-hospitalization within the next 30 days (Tohme et al, 2017; Gray, Cohen, & Brunelli, 2017).

Despite the existence of guidelines for preventing the transmission of Covid-19 among hemodialysis patients, a significant number of them become afflicted and even pass away. Patient compliance has a major impact on the effectiveness of hemodialysis. There is a need for a plan to ensure that this therapy persists during the Covi-1-9 pandemic. Ultimately, patient compliance can reduce mortality and morbidity. There has been no prior examination of patient compliance with hemodialysis during the pandemic. In light of this, it is necessary to determine how patient adherence occurs and the factors that influence it. The findings can be used as a foundation for developing strategies to improve patient adherence and as a source of novel innovations in the treatment of patients with chronic kidney failure. Nurses have the longest interaction time with patients and play a role in promoting patient compliance. Nurses are able to identify adherence promoting and inhibiting factors, patient expectations and desires, provide information, and motivate patients to comply (Bulechek, Butcher, Dochterman, & Wagner, 2016).

METHOD

This is a quantitative study employing descriptive analytic techniques and a cross-sectional design. This study was conducted between April and August of 2021. This investigation has also passed the Poltekkes Kemenkes Jakarta III research ethics committee's ethical review (No. KEPK-PKJ3/086/VIII/2021). A web-based questionnaire was used to capture data, and the results were analyzed using univariate, bivariate, and multivariate statistical tests. Age, gender, education, marital status, employment status, duration of HD, vascular access, dialysis schedule, level of anxiety, knowledge (about health protocols), convenience of access to health services, and family support are independent variables. While the dependent variable is the patient's hemodialysis adherence.

During the Covid-19 pandemic, all of the participants in this investigation were chronic kidney failure patients undergoing routine hemodialysis. While the samples consist of 97 respondents chosen using a technique of purposive sampling, the sample size is 97. The following patients are admissible:

a). Minimum age of 18 required,

b). Perform standard hemodialysis twice per week,

c). Monday through Thursday, Tuesday through Friday, or Wednesday through Saturday,

d). Can read and write and communicate effectively, and

e). Willing to participate as a respondent and provide informed assent.

Patients who were undergoing incidental/temporary (non-routine) HD, were currently hospitalized, or were experiencing physical discomfort were excluded.

RESULT DAN DISCUSSION

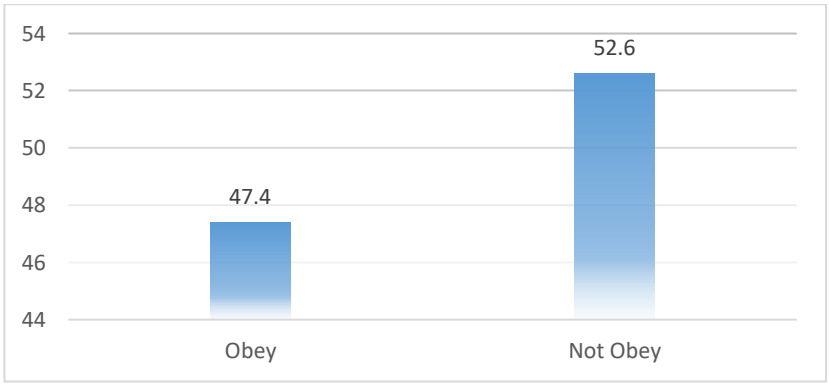
Table 1: Distribution of respondent characteristics (n = 97)

Variable		Frequency	Percentage (%)
Age	≤ 44	44	45,4
	45-59	38	39,2
	≥60	15	15,5
Sex	Female	43	44,3
	Male	54	55,7

Variable		Frequency	Percentage (%)
Education	Elementary school, Junior High School	26	26,8
	Senior High School	41	42,3
	S1, S2, S3	30	30,9
Marital status	Not married yet	11	11,3
	Marry	77	79,4
	Widower/widow	9	9,3
Job status	Work	24	24,7
	Not working/retired	73	75,3
Length of Hemodialysis Therapy	< 1 years	32	33,0
	1-2 years	16	16,5
	> 2 years	49	50,5
Vascular Access Type	Non AVF	20	20,6
	AVF (Cimino)	77	79,4
Dialysis Schedule	Monday-Thursday	35	36,1
	Tuesday-Friday	36	37,1
	Wednesday-Saturday	26	26,8
anxiety level	No worries	5	5,2
	Mild Anxiety	44	45,4
	Moderate Anxiety	38	39,2
	Severe Anxiety	10	10,3
Knowledge of health protocols	Not good	29	70.1
	Good	68	29.9
Access to health services	Difficult	30	30,9
	Easy	67	69,1
Family support	Not good	31	32,0
	Good	66	68,0

Table 1 reveals that the majority of respondents under 44 years old (45.4%) were male (55.7%), and those with the greatest level of education (Senior High School, 42.3%) were Senior High School. The vast majority of respondents are married (79.4%) and unemployed (75.3%). In excess of two years ago, 50.5% of respondents had undergone hemodialysis. The most popular dialysis access is Cimino (AVF), and Tuesdays and Fridays account for 37.1% of all dialysis appointments. The majority of respondents experienced moderate anxiety (45,4%) and are well-versed in health protocols (70%). While undergoing dialysis, the majority of patients admitted that access to dialysis was easy (69.1%) and that they had excellent family support (68%).

Figure 1. Distribution of Respondents by Compliance Level (n=97)



 DOI: http://dx.doi.org/10.35730/jk.v14i1.940

During the pandemic, analysis revealed that 52.6% of patients did not adhere to the hemodialysis schedule and dosage. 38 individuals (74.5%) reduced the duration of dialysis by at least 15 minutes, 13 individuals (25.5%) omitted dialysis at least once per month, and 25.5% did both.

Table 2: Distribution of Hemodialysis Adherence Among Respondents (n = 97)

Variable		Obedience		Frequency	*p value*
		Not Obey	Obey		
Age	≤ 44	22 50,0%	22 50,0%	44	0,799
	45-59	20 52,6%	18 47,4%	38	
	≥ 60	9 60,0%	6 40,0%	15	
Sex	Female	20 46,5%	23 53,5%	43	0,312
	Male	31 57,4%	23 42,6%	54	
Education	Elementary School, Junior High School	21 80,8%	5 19,2%	26	0, 003
	Senior High School	16 39,0%	25 61,0%	41	
	University	14 46,7%	16 53,3%	30	
Marital status	Single	4 36,4%	7 63,6%	11	0,421
	Marry	43 55,8%	34 44,2%	77	
	divorce	4 44,4%	5 55,6%	9	
job status	Work	11 45,8%	13 54,2%	24	0,487
	Not Working	40 54,8%	33 45,2%	73	
Extended Hemodialysis Treatment	< 1 years	12 37,5%	20 62,5%	32	0,107
	1-2 years	9 56,3%	7 43,8%	16	
	> 2 years	30 61,2%	19 38,8%	49	
Vascular Access	Non AVF	11 55,0%	9 45,0%	20	1,00
	AVF	40 51,9%	37 48,1%	77	
Dialysis Schedule	Monday-Thursday	22 62,9%	13 37,1%	35	0,262
	Tuesday-Friday	18 50,0%	18 50,0%	36	
	Wednesday-Saturday	11 42,3%	15 57,7%	26	
Anxiety Level	Not Worried	2	3	5	0,002

Variable		Obedience		Frequency	*p value*
		Not Obey	Obey		
		40,0%	60,0%		
	Mild anxiety	15	29	44	
		34,1%	65,9%		
	Moderate anxiety	25	13	38	
		65,8%	34,2%		
	Severe anxiety	9	1	10	
		90,0%	10,0%		
Knowledge of health protocols	Good	32	36	68	0,122
		47,1%	52,9%		
	Poor	19	10	29	
		65,5%	34,5%		
Access to health services	easy	25	42	67	0,00
		37,3%	62,7%		
	difficult	26	4	30	
		86,7%	13,3%		
Family Support	Good	24	42	66	0,00
		36,4%	63,6%		
	Poor	27	4	31	
		87,1%	12,9%		

Bivariate analysis revealed that patient adherence to hemodialysis during the COVID-19 pandemic was only related to four factors: education level, anxiety level, convenience of access to health services, and family support.

This analysis employs a logistic regression test, beginning with candidate selection, followed by multivariate modeling (full model), and concluding with modeling. Early on, the independent variables were identified. For each independent variable, a straightforward bivariate logistic regression analysis was conducted, and any variable with a p-value 0.25 could enter the multivariate stage immediately.

Table 3. Results of the Logistic Regression Bivariate Analysis

Variable	*p value*
Age	0.525
Sex	0,285
Level of Education	0,014*
Marital status	0,637
job status	0,446
Extended Hemodialysis Treatment	0,039*
Vascular Access	0,807
Dialysis Schedule	0,104*
Anxiety Level	0,000*
Knowledge of health protocols	0,093*
Access to health services	0,000*
Family Support	0,000*

Based on bivariate logistic regression analysis, seven variables had p 0.25, including education level, duration of dialysis, dialysis schedule, degree of anxiety, knowledge of health protocols, ease of access to health services, and family support. In addition, these variables will be incorporated into multivariate modeling, yielding the following results:

 DOI: http://dx.doi.org/10.35730/jk.v14i1.940

Table 4. Multivariate Modeling Results with Full Model Factors Associated with Compliance Undergoing Routine Hemodialysis (n=97)

No	Variable	B	*p value*	OR	95% CI
1	Level of Education	0,791	0,081	2,205	0.908 – 5.356
2	Extended Hemodialysis Treatment	-1,478	0,003*	0,228	0.087 – 0,602
3	Dialysis Schedule	0,447	0,342	1,563	0,622 – 3,927
4	Anxiety Level	-1,657	0,002*	0,191	0,065 – 0,557
5	Knowledge of health protocols	0,245	0,756	1,278	0,272 – 6,002
6	Access to health services	3,676	0,000*	39,470	5,688 – 272,9
7	Family Support	2,859	0,001*	17,437	3,472 – 87,58

According to the results of the analysis, three variables had a p value greater than 0.05: education level, dialysis schedule, and knowledge. The variables with p>0.05 were eliminated in order, beginning with the variable with the largest p, namely knowledge, dialysis schedule, and education level. Next, the change in OR is observed after removing each variable individually. Variables with an OR difference of 10% or greater are included in the subsequent modeling phase. The same procedures yield the following results:

Table 5. Results of the second stage of Multivariate Modeling

Variable	Multivariate Modeling OR Change						
	Initial OR	OR selection 1	% change	OR selection 2	% change	OR selection 3	% change
Level of Education	2,205	2,254	2,22 %	1,939	12,06 %	-	-
Extended Hemodialysis Treatment	0,228	0,235	3,07 %	0,271	18,86 %	0,265	16,22%
Dialysis Schedule	1,563	1,595	2,05 %	-	-	1,192	23,73%
Anxiety Level	0,191	0,189	1,05 %	0,186	2,16 %	0,183	4,188%
Knowledge of health protocols	1,278	-	-	-	-	-	-
Access to health services	39,470	38,972	1,26 %	36,028	8,72 %	42,633	8,01%
Family Support	17,437	17,335	0,58%	21,328	22,31 %	18,477	5,96%

Prior to the final modeling, an interaction test was conducted to determine whether the independent variables interacted significantly. In this study, the variables believed to interact were dialysis history, fluid anxiety levels, access to health services, and family support. After conducting the interaction test, it was determined that the p value of each variable was > 0.05, indicating that there was an interaction between the duration of dialysis and the degree of fluid anxiety, and between access to health services and family support. During the pandemic, the four variables influence patient adherence to dialysis.

In addition, in the final phase, the final modeling was conducted to identify the primary predictors of patient adherence to hemodialysis.

Table 6. Final modeling of factors influencing patient adherence to dialysis during a pandemic (n=97)

Variable	*B*	*p value*	OR	95% C.I
Level of Education	0,813	0,069	2,254	0,9384 – 5,416
Extended Hemodialysis Treatment	-1,447	0,003	0,235	0,092 – 0,604
Dialysis Schedule	0,467	0,316	1,595	0,641 – 3,967
Anxiety Level	-1,664	0,002	0,189	0.065 – 0,556
Access to health services	3,663	0,000	38,97	5,663–268,20
Family Support	2,853	0,001	17,33	3,463 – 86,75

The results of the multivariate analysis revealed that the variable with the smallest p was the variable indicating that convenience of access to health services had the strongest influence on patient adherence to routine hemodialysis during the Covid-19 pandemic. According to the analysis, the Odds Ratio (OR) for the variable Access to Yankes was 38.97, indicating that respondents with difficult access to health services were 38.97 times more likely to disobey the dialysis schedule than respondents with simple access to health services.

Adherence to dialysis is defined as the patient's commitment to undertake hemodialysis therapy according to the consensus dosage of the Indonesian Nephrology Association (Pernefri), namely: two or three times per week for ten or twelve hours per session. Based on the findings of previous studies, 33.6% of patients undergoing dialysis therapy were noncompliant (Ozen, Cinar, Askin, Mut, & Turker, 2019). Twenty-five percent of patients have missed at least one dialysis session, and seventy-two percent of patients shorten their dialysis duration by at least 10 minutes per month (Alhawery, Aljaroudi, Almatar, Alqudaimi, & Sayyari, 2019). The average patient missed dialysis sessions was 1.6 times a month (Freire de Medeiros, Arantes, Tajra, Santiago, Carvalho, & Libório, 2017).

In this investigation, 47.4% of patients undergoing dialysis did not adhere to their treatment regimen. 34 individuals (73.9%) reduced the duration of dialysis by at least 15 minutes, and 12 individuals (26.1%) reported missing dialysis at least once per month. The average number of cancelled dialysis sessions per patient per month was 1.83. This disparity may be attributable to patients' fears and apprehensions about leaving their homes during the Covivirus-19 pandemic. According to research conducted in Iran, psychological issues and individual anxiety have the greatest impact on noncompliance with dialysis therapy regimens (Hadian, Rafiee & Barimnejad, 2016).

Several factors, including dialysis schedules (Tuesday/Thursday/Saturday), smoking habits, a high pain scale, a low level of knowledge, a low quality of life, and youthful age, have been found to be associated with the dialysis session skipping behavior of patients in prior research. While the factors associated with a reduction in dialysis time include the duration of dialysis, a high pain scale, smoking bans during the procedure, and a patient's lower age, these factors are not the only ones (Tohme, et al, 2017). In contrast to previous research, noncompliance with dialysis therapy in this study was associated with education, anxiety, convenience of access to health services, and family support. This difference could be attributable to variations in research conditions. This study evaluates patient compliance with dialysis specifically for the pandemic period.

In this study, education level was also a factor associated with patient compliance. In theory, education level influences the degree of knowledge. The greater one's level of education, the broader one's perspective and knowledge. According to Notoatmodjo (2012), the greater a person's level of education, the simpler it is for him to comprehend new information and related topics. In accordance with the theoretical examination, respondents with the lowest level of education had the lowest compliance in this study. The statistical test results demonstrate a correlation between patient adherence to dialysis and education level during the pandemic.

 DOI: http://dx.doi.org/10.35730/jk.v14i1.940

In this study, the conformance analysis results were only related to the level of education, and not to the knowledge variable. Even though 70.1% of respondents have a solid understanding of health protocols, only 47.4% actually adhere to them. Fear of being exposed to Covid may be one of the causes of this phenomenon. This investigation discovered that anxiety affects patient compliance. Almost all of the participants in this study feared being exposed to Covid-19 (mild to severe scale). Regardless of age, the Covid-19 pandemic has altered living arrangements and increased patient anxiety. Anxiety about exposure to Covid-19 and the existence of a policy to limit public mobility during a pandemic will reduce outside activities, such as hospital visits. This can have an effect on the patient's discipline to adhere to the prescribed dialysis schedule and dosage.

Also influencing patient adherence in this study are family support and accessibility to health services. This study's findings differ from those of previous research, which did not discover a correlation between adherence and hospital proximity (Alhawery, Aljaroudi, Almatar, Alqudaimi, & Sayyari, 2019; Tohme et al, 2017). Hemodialysis patients require the support of their families. Physiological disorders caused by chronic kidney failure result in physical limitations, necessitating the family's complete support. The facilitation of patients' twice-weekly dialysis treatment is one of the most essential forms of assistance. These preparations include preparation, assistance during dialysis, transportation to and from the dialysis center, and return home. This study discovered that respondents with simple access to health services adhere well to dialysis.

Life quality is associated with compliance with dialysis. In contrast, non-adherence to dialysis increases the risk of developing various complications. Shortening the duration of dialysis is independently associated with an increased risk of hospitalization, whereas avoiding dialysis is independently associated with mortality (Tohme et al, 2017). This was also discovered in this research. As many as 51.5% of respondents reported that they had been hospitalized due to noncompliance with dialysis doses. In the past six months, they were hospitalized more than twice on average. Avoiding or reducing the duration of dialysis will result in suboptimal removal of fluids and waste products like urea. This can result in surplus fluid, failure to achieve dry weight, and a reduction in the efficacy of dialysis. Some of these factors are associated with patients' risk of repeated hospitalization (Hidayati, 2018).

There was no correlation between compliance and age, gender, marital status, employment status, duration of dialysis, vascular access, dialysis schedule, or knowledge of health protocols in this study. According to a number of studies, age influences patient adherence to dialysis regimens. Younger patients are more likely to neglect dialysis sessions and have a lower non-adherence rate than older patients (Mellon, Regan & Curtis R, 2013; Lal, Ali, Idrees, & Hafeez, 2019; Tohme et al, 2017). In contrast to previous research, this study found no correlation between age and adherence to hemodialysis therapy. The majority of respondents are younger than 44 years of age, with a compliance rate of 50 percent. In this study, those older than 60 years had the lowest rate of adherence. The difference between this study's results and those of previous research may be attributable to the older average age of the subjects in earlier studies. The difference in results may also be attributable to the difference in the proportion of respondents in each category; in this study, only 15.4% of a total of 97 respondents belonged to the age group above 60 years.

This study also revealed that there was no correlation between gender and compliance; however, male respondents had a higher non-adherence rate than female respondents. For men, the rate of noncompliance with dialysis therapy reached 57.4%. This study is consistent with a number of previous studies which found that male patient nonadherence was greater than female patient nonadherence (Noghan, Akaberi, Pournamdarian, Borujerdi, & Hejazi, 2018; Ozen, Cinar, Askin, Mut, & Turker, 2019). This study's findings are also consistent with the incidence and prevalence of patients with end-stage renal failure, where the proportion of men is greater than that of women (USRDS, 2020). This study's percentage of male noncompliance corresponds to the number of Indonesian hemodialysis patients with kidney failure. 57% of dialysis patients in 2018 were male, according to data from the Indonesian Renal Registry (IRR, 2019).

Men's noncompliance with hemodialysis can be caused by a variety of factors, including their lifestyle and status as breadwinners. The hemodialysis procedure, which lasts four to five hours per session, will cause men to miss two to three days of work per week. Additionally, the majority of males have a lifestyle and smoking habits. To satisfy their desire to smoke, they abbreviate their dialysis sessions due to the lengthy dialysis process. Studies demonstrate that male patients who smoke tend to have shorter dialysis sessions (Alhawery, Aljaroudi, Almatar, Alqudaimi, & Sayyari, 2019; Tohme et al, 2017).

CONCLUSION

The majority of respondents did not adhere to the established dialysis schedule and dosage during the Covid-19 pandemic. Level of knowledge, degree of anxiety, ease of access to health services, and family support are associated with patient compliance. In addition, the study revealed an interaction between the duration of dialysis and the degree of anxiety, as well as an interaction between the convenience of access to health services and family support. In order to reduce patient anxiety so that they remain compliant with hemodialysis during a pandemic, it is necessary to increase family support and the role of healthcare professionals.

ANNOUNCEMENT

We would first like to express our gratitude to the Higher Education Leaders who have supported the research between institutions. Following that, we would like to express our gratitude to the research team, linked hospitals, and research responders.

REFERENCE

[1] Agung, I. M. (2020). Memahami Pandemi Covid-19 Dalam Perspektif Psikologi Sosial. *Psikobuletin: Buletin Ilmiah Psikologi*, *1*(2), 68-84.

[2] Alhawery, A., Aljaroudi, A., Almatar, Z., Alqudaimi, A. A., & Al Sayyari, A. A. (2019). Nonadherence to dialysis among saudi patients–Its prevalence, causes, and consequences. *Saudi Journal of Kidney Diseases and Transplantation*, *30*(6), 1215.

[3] Bulechek, G. M., Butcher, H. K., Dochterman, J. M., & Wagner, C. M. (2016). Nursing Intervension Classification (NIC) (6th ed.). Amerika: Elsevier.

[4] Freire de Medeiros, C. M. M., Arantes, E. P., Tajra, R. D. D. P., Santiago, H. R., Carvalho, A. F., & Libório, A. B. (2017). Resilience, religiosity and treatment adherence in hemodialysis patients: a prospective study. *Psychology, health & medicine*, *22*(5), 570-577.

[5] Gray, KS, Cohen, DE, & Brunelli, SM (2017). In-center hemodialysis absenteeism: prevalence and association with outcomes. *ClinicoEconomics and outcomes research: CEOR*, *9*, 307.

[6] Hadian, Z., Rafiee Vardanjani, L., & Barimnejad, L. (2016). The most important causes of non-adherence in patients on dialysis. *Clinical excellence*, *5*(2).

[7] Hrp, S. A. J., Yustina, I., & Ardinata, D. (2015). Faktor-faktor yang berhubungan dengan tingkat kecemasan pasien hemodialisis di RSUD Dr. Pringadi Medan. *Idea Nursing Journal*, *6*(3), 1-9.

[8] Iskandarsyah, A & Yudiana, W (2020). Informasi COVID-19, Perilaku Sehat Dan Kondisi Psikologis Di Indonesia. Laporan Survei. Fakultas Psikologi Universitas Padjajaran

[9] Kliger, A. S., Cozzolino, M., Jha, V., Harbert, G., & Ikizler, T. A. (2020). Managing the COVID-19 pandemic: international comparisons in dialysis patients. *Kidney International*.

 DOI: http://dx.doi.org/10.35730/jk.v14i1.940

[10] Lal, W., Ali, T., Idrees, M. K., & Hafeez, A. R. (2019). Non-compliance of hemodialysis and related factors among end-stage renal disease patients. *Journal of the Dow University of Health Sciences (JDUHS)*, *13*(3), 128-132.

[11] Li, S., Wang, Y., Xue, J., Zhao, N., & Zhu, T. (2020). The impact of COVID-19 epidemic declaration on psychological consequences: a study on active Weibo users. *International journal of environmental research and public health*, *17*(6), 2032.

[12] Lee, J. J., Hwang, S. J., & Huang, J. F. (2020). Review of the present features and the infection control challenges of COVID-19 pandemic in dialysis facilities. *The Kaohsiung Journal of Medical Sciences*.

[13] Mellon L, Regan D, Curtis R. Factors influencing adherence among Irish haemodialysis patients. Patient Educ Couns. 2013 Jul;92(1):88-93.

[14] National Kidney Foundation: K/DOQI Clinical Practice Guidelines and Clinical Practice Recomendations 2015 Updates: Hemodialysis Adequacy, Peritoneal Dialysis Adequacy and Vaskular Access. Am J Kidney Dis 2015; 48(Suppl 1): S1-S322.

[15] Noghan, N., Akaberi, A., Pournamdarian, S., Borujerdi, E., & Hejazi, S. S. (2018). Resilience and therapeutic regimen compliance in patients undergoing hemodialysis in hospitals of Hamedan, Iran. *Electronic physician*, *10*(5), 6853.

[16] Obialo, C., Zager, PG, Myers, OB, & Hunt, WC (2014). Hubungan ukuran klinik, wilayah geografis, dan ras / etnis dengan frekuensi perawatan 37ialysis yang terlewat / dipersingkat. *Jurnal nefrologi* , *27* (4), 425-430.

[17] Ozen, N., Cinar, F. I., Askin, D., Mut, D., & Turker, T. (2019). Nonadherence in hemodialysis patients and related factors: a multicenter study. *The Journal of Nursing Research*, *27*(4), e36.

[18] Rostanti, A., Bawotong, J., & Onibala, F. (2016). Faktor faktor yang berhubungan dengan kepatuhan menjalani terapi hemodialisa pada penyakit ginjal kronik di ruangan Dahlia dan Melati RSUP Prof. Dr. R. D Kandou Manado. *Jurnal Keperawatan*, *4*(2).

[19] Snyder, R. L., Jaar, B. G., Lea, J. P., & Plantinga, L. C. (2020). Association of patient-reported difficulty with adherence with achievement of clinical targets among hemodialysis patients. *Patient preference and adherence*, *14*, 249.

[20] Tohme, F., Mor, M. K., Pena-Polanco, J., Green, J. A., Fine, M. J., Palevsky, P. M., & Weisbord, S. D. (2017). Predictors and outcomes of non-adherence in patients receiving maintenance hemodialysis. *International urology and nephrology*, *49*(8), 1471-1479. https://doi.org/10.1007/s11255-017-1600-4

[21] Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International journal of environmental research and public health*, *17*(5), 1729.

[22] WHO (2020), Coronavirus disease (Covid-19) Situation Report– 208 https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200815-covid-19-sitrep-208.pdf?sfvrsn=9dc4e959_2