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Analysis of Anxiety Levels in End-Stage Kidney Disease Pa-tients Under Dialysis Therapy

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Abstract: End-stage renal disease has a profound impact on both the physiological and psychological aspects of patients. The consequences of end-stage renal disease extend to anxiety, influenced by the symptoms encountered and the side effects resulting from hemodialysis therapy, which, in turn, affects life expectancy and adherence to disease management. This study aims to investigate anxiety levels in individuals with chronic kidney disease undergoing dialysis. This descriptive analytic study involved a total of 45 respondents undergoing hemodialysis therapy at Jember Klinik Hospital. The instruments utilized included an observational form and the Hamilton Anxiety Rating Scale. The findings revealed varying levels of anxiety, with severe anxiety at 33.3%, moderate anxiety at 31.1%, mild anxiety at 22.2%, and no anxiety at 13.3%. In the anxiety variable, among the 14 observation items on the HARS instrument, the most pronounced disturbances were observed in tension, depression, cardiovascular symptoms, and respiratory symptoms. Anxiety remains a prevalent psychological symptom among many end-stage renal patients. Strategies should be implemented to mitigate anxiety in patients, thereby improving their quality of life and reducing mortality

Keywords: Anxiety, End Stage Renal Disease, Dialisys

INTRODUCTION

End-stage kidney disease is a catastrophic disease which can be life-threatening, requires long-term medical treatment, and requires large medical costs.[1]. The incidence of end-stage renal dis-ease continues to increase. In Indonesia, end-stage kidney failure occurs in 713,783 people, and has increased by 1.8% from the previous health survey. [2]. The morbidity and mortality rate for End Stage Kidney Disease patients is still high, with a mortality rate of around 22%. This high morbidity and mortality can be reduced significantly by carrying out continuous renal replacement therapy. One of which is hemodialysis therapy. The number of End Stage Kidney Disease patients treated with dialysis and transplantation is predicted to continue to increase. Dialysis and transplantation can prolong the lives of hundreds of thousands of patients with End Stage Kidney Disease[3]

Hemodialysis is the most widely used kidney replacement therapy today. Based on several ex-isting kidney replacement therapies, more than 90% of those used are hemodialysis[4]. Patients with end-stage kidney disease who receive hemodialysis therapy when the patient has entered stage 4. Some of the reasons are the difficulty of predicting the speed of progression of kidney disease, the high variability in the degree of decline in kidney function when uremic symptoms occur or when other dialysis indications appear, the response and adaptation of each -Each patient is different in their condition of kidney failure, and the success of installing permanent vascular access varies and takes up to several months[3].

The impact of end-stage kidney disease includes physical weakness and mobility (75%), de-creased appetite (58%), pain (56%), pruritus (56%) and shortness of breath (49%)[5]. Besides the physiological changes

experienced by end-stage kidney disease patients, they also have to undergo regular hemodialysis treatment, adhere to specific diets, manage fluid restrictions, and take pre-scribed medications. Alterations in the treat-ment process can significantly impact the lifestyle of pa-tients, leading to a decline in their quality of life and mental health. These changes may serve as triggers for psychological disturbances in end-stage kidney disease patients [6], [7]

One of the psychological disturbances in patients is the presence of anxiety. Anxiety is a natu-ral alarm response resulting from the perceived or experienced danger by the patient. Anxiety can have negative effects on the body if the response is excessive or inappropriate. [8]. Anxiety in end-stage kidney failure patients can arise due to multiple factors. Some factors may result from lifestyle changes, such as fluid and diet restrictions, regular hemodialysis therapy, and a decline in daily functioning. The longer a patient undergoes hemodialysis therapy, the feelings of boredom, lethargy, and fatigue may emerge, serving as triggers for anxiety in patients [9], [10]

The condition of anxiety in kidney failure patients can act as a trigger for more complex dis-turbances in end-stage kidney disease patients. Unresolved anxiety can lead to various impacts, in-cluding a decrease in quality of life, psychological changes such as depression, and may result in non-compliance in patients [6], [8], [11]. This anxiety disorder has the potential to worsen the pa-tient's health status and may even increase the risk of mortality. Hence, a more detailed analysis of anxiety in end-stage kidney disease patients undergo-ing hemodialysis therapy is necessary

The objective of this research is to analyze anxiety in end-stage kidney disease patients under-going hemodialysis therapy.

METHOD

Study Design

This is a deskripsi analitik study design.

Popullation, Sample and Sampling

The population in this study consists of end-stage kidney disease patients undergoing hemodi-alysis at Jember Clinic Hospital. The total sample size for this research is 45 respondents. The inclu-sion criteria for this study are hemodialysis patients aged less than 60 years, with compos mentis consciousness, and willing-ness to participate as respondents

The Variable, Instrumen, and Measurement

In the research, data on sociodemographic factors (age, gender, income level, religion, duration of he-modialysis, education, family support, history of hospitalization) were gathered using ques-tionnaires based on medical records and self-reports from participants. The variable of anxiety was evaluated utilizing the Ham-ilton Anxiety Rating Scale (HARS) questionnaire, comprising 14 items. Each item is defined by a set of symp-toms and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints associated with anxiety). The relia-bility of the HARS questionnaire was confirmed with a Cronbach's alpha of 0.921, and Bartlett's test of sphericity indicated significance at $p < 0.001$ [12] Anxiety classification in HARS divided into five categories not anxiety (0-14), Mild (15-20), Moderate (28-41), Severe (42-56).[13]

Data analysis

Statistical analysis in this study was performed using SPSS 21 Windows Version

Ethical Consideration

Approval ethics for this study was obtain by the committee of the University of Muhammadi-yah Jember with the registration number. 01220/KEPK/FIKES/I/2021.

RESULTS AND DISCUSSION

In this study, a total of 55 respondents were initially identified, but ultimately, 45 respondents participated. The characteristics of the respondents revealed that the age range most affected by end-stage kidney disease was 46-44 years (40%), predominantly male (66.7%), with an income above the Minimum Regional Wage (66.7%), practicing Islam (95.6%), undergoing hemodialysis for more than 6 months (95.6%), having completed high school education (62.2%), having a history of hospitalization more than 2 times in the last year (82.2%), and consistently receiving family support (97.6%). The sociodemographic results are presented in Table 1.

Tabel 1. Respondent Demographic Data

Category	Total	Category	Total
Age		**Education**	
17-25	3 (6,7%)	No School	2 (4,4%)
26-35	7 (15,5%)	Primary School	1 (2,2%)
26-45	10 (22,2%)	Junior High Schoool	1 (2,2%)
46-55	18 (40%)	Senior High School	28 (62,2%)
56-65	7 (15,6%)	University	13 (28,9%)
Gender		**Income**	
Male	30 (66,7%)	Above Minimum Wadge	30 (66,7)
Female	15 (33,3%)	Above Minimum Wadge	15 (33,3%)
Religion		**History of Hospitalization**	
Islam	43 (95,6)	**(Last 1 Year)**	
Kristen	1 (2,2%)	1—2 times	28 (17,8%)
Protestan	1(2,2%)	More than 2x	37 (82,2%)
Time on Hemodialysis		**Family Support**	
>6 Bulan	43 (95,6%)	Always	34 (75,6%)
<6 Bulan	2 (4,4%)	Sometimes	11 (24,4%)

The anxiety levels among end-stage kidney disease patients undergoing hemodialysis treatment revealed that the majority of patients experienced severe anxiety, with 15 respondents (33.3%), followed by mod-erate anxiety with 14 respondents (31.1%). Mild anxiety was reported by 10 respondents (22%), and no anxiety by 13%. These findings are presented in Table 2

Tabel 2. Anxiety Levels of End-Stage Kidney Disease Patients Undergoing Hemodialysis Therapy

Anxiety Level	Total
Not Anxety	6 (13,3)
Mild	10 (22,2)
Moderate	14 (31,1)
Sevare	15 (33,3)

Based on the cross-tabulation of sociodemographic factors and anxiety levels, it was found that severe anxiety occurred within the age group of 46-55 years (13.3%), among males (24.4%), those with an income above the Minimum Regional Wage (24.4%), followers of Islam (31.1%), and those who always receive family support (24.4%). In addition, for the moderate anxiety level, the majority of respondents were observed in those who had undergone hemodialysis for less than 6 months (31.1%) and consistently received family support (24.4%). The cross-tabulation results are presented in Table 3

Table 3. Sociodemographic and tingkat kecemasan pasien penyakit ginjal tahap akhir (n=45)

Variabel	Level Anxiety				Total
	Not Anxi-ety	Mild	Moderate	Severe	
Age					
17-25	0	1 (2,2)	1 (2,2)	1 (2,2)	3 (6,7)
26-35	0	1 (2,2)	5 (11,1)	1 (2,2)	7 (15,6)
26-45	3 (6,7)	2 (4,4)	2 (4,4)	3 (6,7)	10 (22,2)
46-55	2 (4,4)	5 (11,1)	5 (11,1)	6 (13,3)	18 (40)
56-65	1 92,2)	1 (2,2)	1 (2,2)	4 (8,9)	7 (15,6)
Gender					
Male	4 (8,9)	7 (15,6)	8 (17,8)	11 (24,4)	30 (66,7)
Female	2 (4,4)	3 (6,7)	6 (13,3)	4 (8,9)	15 (33,3)
Pendapatan					
Dibawah UMR	1 (2,2)	6 (13,3)	4 (8,9)	4 (8,9)	15 (33,3)
Diatas UMR	5 (11,1)	4 (8,9)	10 (22,2)	11 (24,4)	30 (66,7)
Religion					
Islam	6 (13,3)	10 (22,2)	13 (28,9)	14 (31,1)	43 (95,6)
Kristen	0	0	0	1 (2,2)	1 (2,2)
Protestan	0	0	1 (2,2)	0	1 (2,2)
Time on Hemodialysis					
>6 Bulan	0	0	0	2 (4,4)	2 (4,4)
<6 Bulan >	6 (13,3)	10 (22,2)	14 (31,1)	13 (28,9)	43 (95,6)
Education					
No School	0	2 (4,4)	0	0	2 (4,4)
Primary School	0	0	1 (2,2)	0	1 (2,2)
Junior High Schoool	0	0	1 (2,2)	0	1 (2,2)
Senior High School	4 (8,9)	6 (13,3)	9 (20)	9 (20)	28 (62,2)
University	2 (4,4)	2 (4,4)	3 (6,7)	6 (13,3)	13 (28,9)
History of Hospitali-zation (Last 1 Year)					
1—2 times		2 (4,4)	3 (6,7)	3 (6,7)	8 (17,8)
More than 2x	0	8 (17,8)	11 (24,4)	12 (26,7)	37 (82,2)
	6 (13,3)				
Family Support					
Always	3 (6,7)	9 (20)	11 (24,4)	11 (24,4)	34 (75,6)
Sometimes	3 (6,7)	1 (2,2)	3 (6,7)	4 (8,9)	11 (24,4)

The results of the anxiety level analysis using the HARS scale instrument adapted to the category of 'very severe' indicate that the highest occurrences are related to tension, with 2 respondents, depression with 5 respondents, and cardiovascular and respiratory symptoms with 1 respondent. The detailed analysis of each question item is presented in Table 4

Tabel 4. he data on respondents' answers to the HARS scale

Variable	Not Present	Mild	Moderate	Severe	Very Severe
Anxious Mood	5 (11,1%)	6 (13,3%)	26 (57,8%)	8 (17,8%)	-
Tension	3 (6,6%)	16 (35,6%)	17 (37,8%)	7 (15,6%)	2 (4,4%)
Fears	6 (13,3%)	18 (40%)	14 (31,1%)	7 (15,6%)	-
Insomnia	1 (2,2%)	14 (31,1%)	25 (55,6%)	5 (11,1%)	-
Intellectual	8 (17,8%)	15(33,3%)	5 (11,1%)	17 (37,8%)	-
Depressed Mood	11 (24,4%)	17 (37,8%)	9 (20%)	3 (6,7%)	5 (11,1%)
Somatix (Muscular)	3 (6,7%)	13 (28,9%)	20 (44,4%)	9 (20%)	
Somatic (Sensory)	6 (13,3%)	18 (40%)	14 (31,1%)	7 (15,6%)	-
Cardiovasular Symptoms	2 (4,4%)	23 (51,1%)	8 (17,8%)	11 (24,4%)	1 (2,2%)
Respiratory Symptoms	1 (2,2%)	13 (28,9%)	20 (44,4%)	10 (22,2%)	1 (2,2%)
Gastrointestinal Symptoms	6 (13,3%)	19 (42,2%)	13 (28,9%)	7 (15,6%)	
Genitourinary Symptoms	10 (22,2%)	20 (44,4%)	10 (22,2%)	5 (11,1%)	-
Automatic Symptoms	2 (4,4%)	19 (42,2%)	19 (42,2%)	5 (11,1%)	-
Behavior at Interview	4 (8,9%)	20 (44,4%)	15 (33,3%)	6 (13,3%)	

Based on our conducted research, it was found that the majority of end-stage kidney disease patients undergoing hemodialysis therapy experience anxiety, with 86.7% experiencing anxiety ranging from mild to severe, and 13.3% not experiencing any anxiety. There were no patients in the study who reported experiencing very severe anxiety or panic. Anxiety is a prevalent phenomenon among end-stage kidney disease patients undergoing hemodialysis, as indicated by various studies reporting anxiety occurrences in 60-100% of such patients. [11], [14], [15].

In this study, anxiety was observed among respondents across mild to severe levels. Mild anxi-ety was reported by 10 respondents (22.2%), moderate anxiety by 14 respondents (31.1%), and se-vere anxiety by 15 respondents (33.3%). The most prevalent level of anxiety in this study was se-vere, but the difference with mild and moderate anxiety levels was not significantly pronounced. This is consistent with a previous study conducted in Pakistan, which found that 70% of end-stage kidney disease patients experienced anxiety, with 32.1% exhibiting moderate to severe anxiety lev-els [16].

At the severe anxiety level, it was predominantly observed in the age group of 45-56 years, with 6 respondents (13.3%), making it the most prevalent age category for this level of anxiety. This finding aligns with a prior study conducted by Kandou [17]in Manado, which identified the age group of 45-56 years as the most affected, comprising 32.4% of respondents with anxiety. In addi-tion to age, other demographic data, such as gender, indicated that males were more likely to expe-rience severe anxiety compared to females, who were more predominant in the moderate anxiety category. Male gender may serve as one of the predictors for moderate and severe anxiety in end-stage kidney disease patients [16]. At the income level, it was found that respondents with incomes below the Minimum Regional Wage (UMR) were more prone to mild anxiety, whereas those with incomes above the UMR were more likely to experience severe anxiety. Income level alone may not fully depict an individual's financial pressure; conversely, financial stress in daily life can act as a trigger for anxiety in individuals. [18]. This can be influenced by an individual's lifestyle in navigating life.

Another variable analyzed in this study is the duration of hemodialysis, where patients under-going hemodialysis for less than 6 months experienced severe anxiety, while respondents undergo-ing hemodialysis

for more than 6 months showed moderate anxiety (31.1%). The duration of hemo-dialysis can be a factor influencing an individual's anxiety (p-value 0.010) [14]. Patients undergoing hemodialysis for the first time require adaptation to the changes they are experiencing, while those who have been undergoing hemodialysis for an extended period are capable of adapting to the con-ditions. In terms of education, respondents with a high school diploma and diploma education level showed a quite varied level of anxiety. A study conducted by Mosleh et all [19] indicated no corre-lation between education and patient anxiety. Lower education levels may be a factor causing pa-tients to be unemployed, which could potentially be an indicator of increased anxiety in patients [20]. Based on the presence of family support, patients who receive occasional family support some-times exhibit a higher level of severe anxiety compared to other anxiety levels. On the other hand, patients who consistently receive family support show varied results. Patients with low family sup-port may demonstrate a decrease in life expectancy and can also increase anxiety in patients [21].

Analysis of anxiety levels in end-stage kidney disease patients undergoing hemodialysis, based on the HARS research instrument, revealed that symptoms of very severe anxiety were observed in questions related to tension (4.4%), feelings of depression (11.1%), and followed by issues in the cardiovascular and respira-tory systems, each at 2.2%. According to this data, feelings of depression emerged as the most prevalent symptom of very severe anxiety. In end-stage kidney disease pa-tients, depression can occur in 48-58.3% of cases. The symptoms of depression tend to increase with the progression of end-stage kidney disease, partic-ularly in the advanced stages, with a significant rise observed in stage V or end-stage renal disease [9], [22]. Tension in end-stage kidney disease pa-tients can be caused by concerns arising from the uncertainty of the disease they are facing. Some symptoms of tension that may manifest in patients with anxiety include feelings of being on edge, fatigue, difficulty in resting, being easily startled, easy crying, trembling, and restlessness [13], [23]. In the symptoms of the cardiovascular system, especially in end-stage kidney disease patients un-dergoing hemodialysis, the symptoms that manifest are not solely a result of the patient's anxiety but also the consequences of end-stage kidney disease undergoing hemodialysis therapy. In hemodialy-sis patients, sev-eral cardiovascular disorders that may occur include left ventricular hypertrophy, myocardial fibrosis, mi-crovascular disease, accelerated atherosclerosis, and arteriosclerosis. Moreo-ver, hemodialysis itself may ad-versely impact the cardiovascular system due to non-physiological fluid removal, leading to hemodynamic instability and the initiation of systemic inflammation [24]. The respiratory system disorders can be attributed not only to anxiety but also to the consequences of end-stage kidney disease and the hemodialysis therapy received. In hemodialysis patients, respir-atory system disorders may result from anemia and gas transfer defects, fluid overload and prema-ture airway closure, ventilation-perfusion mismatching, hypoxemia due to centrally driven hypoven-tilation, uremic respiratory muscle dysfunction, and severe mechanical loading. Various functional pulmonary abnormalities, including restriction, obstruction, and impaired diffusion ca-pacity, have been reported in these patients [25].

Based on the findings of this study, anxiety in end-stage kidney disease patients undergoing hemodial-ysis can result from both physical and psychological disturbances. Feelings of anxiety and fear are initial responses observed in patients undergoing hemodialysis. According to a qualitative study byJuwita & Kartika, (2019) physiological conditions experienced by patients include fatigue, nausea, unstable blood pressure, and tingling sensations in the legs. The impact of deteriorating health conditions can affect the patients' activities, leading to fatigue and difficulty sleeping. An-other contributing factor to anxiety is fluid restriction, with 50% of patients found to be non-compliant with fluid restrictions despite understanding the potential consequences. The routine dial-ysis sessions conducted twice a week for 4-6 hours each time can induce feelings of boredom, occa-sional laziness, and fatigue. Even though treatment expenses are covered

by insurance, the repetitive nature of dialysis can lead to patient boredom. Additionally, some patients undergoing hemodialysis may experience sexual dysfunction [8]. hese conditions collectively contribute to an increased level of anxiety in patients undergoing hemodialysis therapy."

This research encountered several limitations. Firstly, the sample size was relatively small, and there is a need for more diverse cases from different locations. Secondly, the study lacked randomi-zation. Thirdly, the absence of a control group was notable, particularly in examining the distinctions between elderly and non-elderly respondents, as the concept of frailty is more commonly applied to the elderly.

CONCLUSION

End-stage kidney disease patients undergoing hemodialysis exhibit a notable level of anxiety. Among these patients, severe anxiety symptoms are most prevalent in tension, feelings of depres-sion, and changes in the cardiovascular and respiratory systems. Interventions for anxiety in end-stage kidney disease patients undergoing hemodialysis should be implemented to enhance their quality of life and reduce mortality.

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