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Determinants of the Support System and Quality of Life for Post-COVID-19 Patients

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Abstract
The impact of the COVID-19 pandemic has caused a change in habits for post-COVID-19 patients in Indonesia. Support system, both informal and formal, are very important for the successful treatment and recovery of post-COVID-19 patients. The level of knowledge, attitudes and behavior of the patient's family is also significantly influential on the support system, especially for comorbid patients who undergo a longer recovery process. The objective of this study to determine the determinants of the support system and quality of life in post-COVID-19 patients in Ende Regency. The type of research used is analytic observational using a cross sectional study design. The sampling method used cluster random sampling. The sample used proportional allocation technique with a sample of 110 respondents. The results of the study found that the variables that had a significant relationship with the support system and quality of life of post-COVID-19 patients were the respondent's age (p=0.001), quality of life (p=0.001), family attitudes (p=0.001), family behavior (p=0.001), health status (p=0.001) and the patient's comorbid history (p=0.001), while for family knowledge variables (p=0.051) and (p=0.129), and there is no significant relationship for symptoms when suffering from COVID-19 (p=0.078) and (p=0.717). The conclusion is that the support system provided to people with various determinants when facing the situation after the coronavirus pandemic is very important in improving the physical and psychological dimensions. A good support system can reduce various forms of stress, improve coping mechanisms and improve the quality of life of post-COVID-19 patients.

Keywords: Support System, Quality of Life, Post-COVID-19 Patients.

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1. INTRODUCTION

Worldometer reported that there are about 157 million cases of COVID-19 worldwide from 223 countries today, of which about 18 million are active cases (Djalante et al., 2020; Singhal, 2020; Worldometer, 2021). The Pusdatin (Pusat Data dan Informasi) of the Indonesian Ministry of Health reported that as of May 9, 2021, the number of COVID-19 sufferers was 1,7113,684 cases, 1,568,277 people had recovered and 47,012 people had died (Kementerian Kesehatan Republik Indonesia, 2022). The number of COVID-19 sufferers in East Nusa Tenggara (ENT) Province on May 9, 2021 was 15502 cases, 13,977 people recovered and 427 people died. Data on COVID-19 sufferers in one of the districts of East Nusa Tenggara Province, that is Ende Regency, on March 22, 2021, the number of positive cases of COVID-19 was 661 cases and on May 9, 2021, the number of cases had increased to 827 cases, 747 people recovered and 12 people died (Kementerian Kesehatan Republik Indonesia, 2022; Worldometer, 2021).

Corona virus is transmitted through droplets or saliva from patients with confirmed COVID-19 to other people and causes symptoms of dry cough, fever, shortness of breath, loss of sense of smell, loss of sense of taste, nausea, vomiting, weakness, headache, red eyes, redness on the skin, and diarrhea (Djalante et al., 2020; Singhal, 2020). Patients undergoing self-quarantine/isolation could feel stress, loneliness, causing psychosocial stress, anxiety and worsening physical and mental illness (Liu et al., 2020; Kementerian Kesehatan Republik Indonesia, 2022). Many post-COVID-19 patients with comorbid conditions have to struggle with getting this treatment that affects their quality of life. This influence will have an impact not only on the physical health aspect, but also on the patient's mental health and social relationships (Wenham et al., 2020).

Support system is support in the form of verbal or nonverbal information or advice that is indispensable for the success of patient care (Giebel et al., 2021; Rosyanti & Hadi, 2020). Many studies revealed that support system can have a positive impact on the immune, neuroendocrine, and cardiovascular systems (Artama et al., 2017). In the research of Kaligis et al., (2020), explained that people's thought processes, behaviors, and emotional responses to an outbreak vary greatly according to their own background and the community where they live. For some people, misinformation, uncertainty, and fear of contagion can increase stress and anxiety, which can lead to mass panic. Mental health education and psychological support from all stakeholders, such as governments, health professionals, and communities, are essential during the pandemic. People with low support system are at a higher risk of death than those with high social support, an increased chance of survival and a better quality of life for a person (Xu et al., 2020; Yang et al., 2020). Good support system certainly has a positive effect on the physical and psychological recovery process for post-COVID-19 patients, particularly in patients with comorbidities. However, the current conditions in Ende district are still many family members who do not understand the importance of the support system for post-COVID-19 patients. Thus, this research is to answer this gap by analyzing the pattern of the support system and then making improvements through direct intervention to the patient's family. The objective of this study is to determine the determinants of the support system and quality of life in post-COVID-19 patients in Ende Regency, East Nusa Tenggara Province.

2. RESEARCH METHOD

The research method used is analytical observation using a cross sectional study design where all subjects and research variables are observed and measured at the same time (point time approach). The study was conducted in the four highest sub-districts with COVID-19 in Ende Regency, which were Central Ende, East Ende, North Ende and South Ende Districts. Respondents are post-COVID-19 sufferers who live in the sub-district area with the inclusion criteria residing in The Districts of Ende Tengah, Ende Timur, Ende Utara, and Ende Selatan,

respondents have a history of suffering from COVID-19 with the lowest age of adolescents and can communicate well. The population in this study were all patients with post-COVID-19 in Ende Regency. The sampling method used cluster random sampling with a total sampling of 110 respondents. Collecting data were conducted through interviews using a demographic data questionnaire, a support system questionnaire and the WHOQOL-BREF was employed to measure the quality of life. Moreover, other data obtained through direct measurements of the health status of respondents. Data analysis used computer application. Bivariate analysis applied Spearman test and Mann Whitney test (value $\alpha = 0.05$) because the distribution of the data obtained was not normal. This research has also received ethical approval from the Section of the Research Ethics Committee of Poltekkes Kemenkes Kupang No. LB.02.03/1/0110/2022 dated April 1, 2022.

3. RESULTS AND DISCUSSION

Based on data obtained from February 23 to April 30 2022. The selected respondents were patients who have been diagnosed with COVID-19 infection in accordance with the inclusion criteria. The measuring tools used were the support system questionnaire, quality of life, family knowledge, family attitudes, family behavior related to COVID-19 prevention and the health status of the respondents. After the data was collected, the researchers grouped and analyzed the data. The results of the univariate analysis describe the distribution of respondents according to age, gender, marital status, education level, occupation, symptoms when suffering from COVID-19, comorbid history, health status, support system, quality of life, family knowledge, family attitudes and family behavior related to COVID-19 prevention.

Table 1. Distribution of Respondents by Gender, Marital Status, Education Level, Occupation, Symptoms when Suffering from COVID-19, Comorbid History, Health Status in Ende Regency, Nusa Tenggara Timur Province (n=110).

Variable	Category	Total	Percentage (%)
Gender	Man	37	33.6
	Woman	73	66.4
Marital status	Married	57	51.8
	Not married yet	48	43.6
	Widow/widower	5	4.5
Level of education	Elementary school/equivalent	12	10.9
	Junior high school/equivalent	6	5.5
	Senior high school/equivalent	29	26.4
	University/Higher education	63	57.3
Occupation	Civil servants/National armies/National policemen	19	17.3
	Private employees	18	16.4
	Farmers/Fishermen	3	2.7
	Honorary	3	2.7
	Self-employed	50	45.5
	Not working/Activities at home	17	15.5
Symptoms when suffering from COVID-19	Asymptomatic	35	31.8
	Symptomatic	75	68.2

Variable	Category	Total	Percentage (%)
History of comorbid disease	Yes	20	18.2
Health status	Well	91	82,7
	Not good	19	17,3

Table 1 show that illustrates the proportion of respondents by gender, the majority are women (66.4%) with the most marital status, which are married status (51.8%), tertiary education level (57.3%), employment status mostly as self-employed (50%) and seen from the symptoms of the respondent's illness when suffering from COVID-19, the most were symptomatic (68.2%). Moreover, the majority of respondents did not have a history of comorbidities (81.8%) and about (82.7%) were in good health status.

Table 2. Distribution of Respondents by Age, Support system, Quality of life, Family Knowledge, Family Attitudes and Family Behavior related to COVID-19 prevention in Ende Regency, Nusa Tenggara Timur Province (n=110)

Variable	Mean	Median	SD	Min-Max	95% CI
Age	37.94	35.00	15.062	15-76	35.09-40.78
Support system	43.80	42.00	6.428	33-68	42.59-45.01
Quality of life	94.00	92.00	15.246	61-128	91.12-96.88
Family knowledge	8.45	9.00	1.386	5-10	8.19-8.72
Family attitude	11.34	11.00	2.499	6-18	10.86-11.81
Family behavior	19.21	19.50	2.943	12-30	18.65-19.77

Table 2 shows that the mean age of the respondents is 37.94 years with a standard deviation of 15,062. The youngest is 15 years old and the oldest is 76 years old. The results of the interval estimation can be concluded that it is 95% believed that the average age of the respondents is between 35.09-40.78 years. The average respondent's support system is 43.80 with a standard deviation of 6.428. Quality of life was measured by the WHOQOL questionnaire with the average quality of life being at a score of 94.00 with a standard deviation of 15.246. The average score of family knowledge related to COVID-19 prevention is 8.45 with a standard deviation of 1.386. The average score of the respondent's family attitude regarding COVID-19 prevention is 11.34 with a standard deviation of 2,499. The average behavior of the respondent's family regarding the prevention of COVID-19 is 19.21 with a standard deviation of 2,943.

Bivariate analysis was employed to determine whether there was a significant relationship between respondent characteristics, anxiety, depression, coping and social support with quality of life analyzed using the Man Whitney test and the Spearman correlation test. Prior to the correlation test, normality tests were conducted on the variables of age, support system, quality of life of post-COVID-19 patients, family knowledge, family attitudes, and family behavior related to COVID-19 prevention using the Kolmogorov-Smirnov. The results of the normality test for all variables presented that the data distribution was not normal ($p < 0.05$), thus, the tests used were the Mann Whitney test and the Spearman test.

Table 3. Distribution of post-COVID-19 patient support systems according to age, quality of life, knowledge, attitudes and family behavior related to COVID-19 prevention in Ende Regency, East Nusa Tenggara Province (n=110).

Variable	r	*p-value*
Age	-0.350	0,001[a]
Quality of life	0.567	0,001[a]
Family knowledge	0.187	0.051[a]*
Family attitude	0.370	0,001[a]
Family behavior	0,280	0,003[a]
Health Status	0.391	0,001[a]

[a]*Spearman test*
*p-value > 0,05

Table 3. above shows that the relationship between age and the patient support system after COVID-19 is obtained with p value = 0.001 meaning that there is a significant relationship between the age of the respondent and the support system. The Spearman correlation value of -0.350 has a weak relationship strength with a negative correlation, meaning that the older you get, the less the support system. In the quality-of-life variable, a p value = 0.001 is obtained which indicates there is a significant relationship between the respondent's quality of life and the post-COVID-19 patient support system. The Pearson correlation value of 0.567 shows that the relationship between quality of life and the support system has a moderate relationship with a positive correlation, meaning that the larger the support system, the better the quality of life. The results of the analysis of the relationship between family knowledge regarding the prevention of COVID-19 and the support system for post-COVID-19 patients obtained p value = 0.051 which shows that there is no significant relationship between family knowledge and the support system. The correlation value of 0.187 indicates a very weak relationship strength with a positive correlation meaning that the higher the knowledge is, the more the support system will increase. The results of the analysis of family attitudes and behaviors and the health status of respondents related to the prevention of COVID-19 with the patient's support system after COVID-19 obtained a value of p<0.05 which showed that there was a significant relationship with the support system with the value having a weak relationship with a positive correlation, meaning that the better the attitude and behavior of the family, the greater the support system.

Table 4. Distribution of post-COVID-19 patient support system according to symptoms when suffering from COVID-19 and history of comorbidities in Ende Regency, East Nusa Tenggara Province (n=110).

Variable	Category	Mean Rank	p-value
Symptoms when suffering from COVID-19	Asymptomatic	63.33	0,078[a]*
	Symptomatic	51.85	
History of comorbid disease	Yes	27.70	0,001[a]
	Not	61.68	

[a]*Man-Whitney test*
* p-value > 0,05

In table 4, it can be identified that the relationship between symptoms of illness when suffering from COVID-19 and the support system of post-COVID-19 patients obtained a p value of 0.078, meaning that there is no significant relationship between these variables and the support system of post-COVID-19 patients. However, for the relationship between a history

of comorbid disease and the support system of post-COVID-19 patients, a p value = 0.001 was obtained which indicates that there is a significant relationship between the history of comorbidities and the support system of post-COVID-19 patients.

Table 5. Distribution of Quality of life by Age, Knowledge, Attitudes and Behavior of Families related to COVID-19 prevention and Health Status in Ende Regency, East Nusa Tenggara Province (n=110)).

Variable	r	p-value
Age	-0.551	0,001[a]
Family knowledge	0.145	0,129[a]*
Family attitude	0.393	0,001[a]
Family behavior	0.352	0,001[a]
Health Status	0.337	0,001[a]

[a]*Spearman test*
**p-value > 0,05*

Table 5. above shows that the relationship between age and quality of life of patients after COVID-19 is obtained p value = 0.001 meaning that there is a significant relationship between the age of the respondent and the quality of life of patients after COVID-19. The Spearman correlation value of -0.551 has a moderate relationship strength with a negative correlation, meaning that the older it is reached, the less the quality of life for post-COVID-19 patients. The results of the analysis of the relationship between family knowledge related to COVID-19 prevention and the quality of life of post-COVID-19 patients obtained a p value of 0.129 which indicates that there is no significant relationship between family knowledge and the support system. The correlation value of 0.145 indicates a very weak relationship strength with a positive correlation meaning that the higher the knowledge, the higher the quality of life of post-COVID-19 patients. The results of the analysis of family attitudes and behaviors as well as the health status of respondents related to the prevention of COVID-19 with the quality of life of patients after COVID-19 obtained a value of p = 0.01 which showed that there was a significant relationship with the support system with the value of having a weak relationship with a positive correlation meaning that the better the attitudes and behaviors of the family and the health status of the respondents the greater the quality of life of the respondents.

Table 6. Distribution of quality of life of post-COVID-19 patients according to symptoms when suffering from COVID-19 and history of comorbidities in Ende Regency, East Nusa Tenggara Province (n=110)

Variable	Category	Mean Rank	*p-value*
Symptoms when suffering from COVID-19	Asymptomatic	53.89	0,717[a]*
	Symptomatic	56.25	
History of comorbid disease	Yes	31.48	0,001[a]
	Not	60.84	

[a]*Man-Whitney test*
* *p-value > 0,05*

In table 6, it can be seen that the relationship between symptoms of illness when suffering from COVID-19 and the quality of life of patients after COVID-19 obtained p value = 0.717, meaning that there is no significant relationship between symptoms of illness when suffering from COVID-19 and the quality of life of patients after COVID-19. However, it is different for the relationship between the history of comorbid diseases and the quality of life of patients after COVID-19, the p value = 0.001 which shows that there is a significant relationship between the history of comorbidities and the quality of life of patients after COVID-19.

Since the COVID-19 pandemic has hit the whole world, it is undeniable that COVID-19 is not just a physical health problem. However, COVID-19 is also with mental health. There are even some things that are detected as mental health problems that are commonly experienced by COVID-19 patients, such as sleep disorders, high anxiety, and even depression. Therefore, a good support system is needed from other parties such as family, friends, relatives and even related agencies to reduce the potential for patients experiencing mental health. Through this study, determinants were found that can influence the provision of a support system, namely age, family attitudes and behavior, patient health status and a history of comorbid diseases. The support system is a form or encouragement from the surrounding environment in the form of attention, affection or appreciation to prevent, overcome and reduce negative effects that can harm each individual, so that the individual feels comfortable and cared for, and can reduce the emergence of stress (Qi et al., 2020; Xiao et al., 2020; Szkody et al., 2021). Based on this explanation, it can be implied that the existence of a support system in the form of caring can reduce negative things in individuals. Until recent time, there is a few research that present data on support systems and quality of life in post-COVID-19 patients.

Based on the test results, it was discovered that age is related to the support system and the quality of life of patients after COVID-19, such is the case with several studies that have found that a person's age has a relationship with the needs of the support system and the quality of life of the patient (Cao et al., 2020; Greenhalgh et al., 2020). The physical condition of the post-COVID-19 patient is associated with the condition of the age and health status experienced. It is a natural process that increasing age will be accompanied by changes in physical, psychological and social conditions that interact with each other (Cao et al., 2020; Ornell et al., 2020; El-Zoghby, Soltan and Salama, 2020). This situation tends to have the potential to cause health problems in general and mental health in particular. The decline in physical condition and weakness after suffering from COVID-19 can raise concerns about social functions in the family or community. If this worry is excessive, it will have an impact on the onset of depression and a decrease in quality of life. It is as stated by Wu et al., (2021), which states several risk factors that support the occurrence of health problems, comprising of poor physical health, separation from spouse or family due to independent isolation from COVID-19 disease, reduced financial resources, and reduced social support. Meanwhile, several studies have shown an association between the impact of isolation at home and higher rates of depression in young adults (Qi et al., 2020; Serafini et al., 2020), which means that the younger age required to self-isolate is more impactful and related to their mental well-being (Cai et al., 2020).

Support system is very effective in dealing with psychological stress in difficult and depressed situations (Hou et al., 2020). For instance, support system helps strengthen the body's immune function, suppress physiological responses to stress and strengthen functions to respond to disease. Traumatic experiences usually occur from the initial period of suspicion of being infected with COVID-19 to during quarantine before treatment. Loneliness as a result of separation from loved ones, fear of death, worries about the physical health of their family (Cai et al., 2020), and uncertainty about future life, causes or worsens physical and mental health conditions. Anxiety and fear occur so that the patients were not able to sleep through the night even after COVID-19 treatment (Cai et al., 2020). Patients with COVID-19 and post-COVID-19, will have the potential to have continued traumatic experiences due to the continuous sense of disturbance that is felt and negative reactions from the community, thereby worsening the quality of life of sufferers after COVID-19.

Post-COVID-19 patients usually still accept negative views and feel deliberately avoided by their families and society. Abdillah (2020), explained that post-COVID-19 patients have

suffered stigma from society leading to a form of 'social death'. Many patients tend to internalize the exclusionary behavior and attitudes of their family or society towards them, which results in decreased self-esteem and feelings of increased prejudice that lead to decreased physical and mental health. Unclear knowledge, attitudes and behavior of families related to COVID-19 are parameters that lead to negative responses to post-COVID-19 patients which in the end has the potential to cause misunderstandings and spread inaccurate information about post-COVID-19 sufferers. However, in this study, the relationship between family knowledge and the support system and quality of life of post-COVID-19 patients did not find a significant relationship, but the relationship between family attitudes and behavior with the support system and quality of life of post-COVID-19 patients had a significant relationship. It can be identified that good knowledge without being accompanied by family attitudes and behavior will not have a good positive impact on providing family support systems and quality of life in post-COVID-19 patients. Thus, we require a clear model or guide on family health management for post-COVID-19 sufferers (Zhao et al., 2020).

The family support system in terms of motivating and minimizing anxiety after suffering from COVID-19 is tremendously crucial in supporting the physical and emotional needs of sufferers. With a good family support system, anxiety resulting from negative stigma and the period of separation when doing self-isolation can be overcome so that patients will feel comfortable while undergoing follow-up care, particularly in patients with a history of comorbidities or sequelae of the COVID-19 virus infection (Peprah and Gyasi, 2021). Patients who feel comfortable during treatment and recovery of disease prevent a decrease in the immune system so that it affects the healing process and improves their health status. The support system in dealing with the situation after the current coronavirus pandemic is significantly essential in the human health dimension. The support system can come from close family, friends, coworkers, neighbors and friends in activities. Social contact is also crucial for physical and mental health (Yu et al., 2020).

Support systems are required in every important process and crisis in life, many people withdraw because they do not know what to say and do and how to help others. While at home, post-COVID-19 patients are considered patients who have been cured but still need informal care. Home is a sanctuary from the outside world, where people feel belonging. Hence, families or relatives who are in the home environment with post-COVID-19 patients can find out all correct and appropriate information about the prevention and care of post-COVID-19 patients. The attitudes and behavior shown by the family will have a positive impact on providing support systems to post-COVID-19 patients (Artama & Owa, 2022). It is as stated by El-Zoghby et al., (2020), that supports from family is the most important element in helping individuals solve problems if there is support, self-confidence and motivation to deal with problems that occur will increase. People with high support system will be able to reduce the stress they experience (they know that there is someone who will be able to help them) so that someone who does not care about the amount of stress or anxiety that will be experienced can support in improving their quality of life. Social contact and support can help reduce stress, depression, anxiety and isolation, and improve self-esteem, normal life, well-being and quality of life, while a lack of social support has the opposite effect.

The positive effect of a good support system can be explained that this support has a direct impact on health and well-being because it provides comfort, a sense of purpose in life and security. Support systems can reduce various forms of stress, improve coping mechanisms and improve quality of life (Kaligis, Indraswari, & Ismail, 2020). Support when the relationship is sporting can help psychological relationships, strengthen healthy living practices and aid recovery from illness (DePierro, Lowe, & Katz, 2020). Therefore, the support provided is closely related to determinants of the patient's family such as and family behavior towards patients or patients post-COVID-19. Another determinant factor that influences the support

system and quality of life of COVID-19 patients is the symptoms and health status of patients when suffering from COVID-19. Patients with this condition seem to get a good support system compared to COVID-19 patients without symptoms or other health problems.

Patients who are in a period of healing and recovery will recover faster if they get a support system that comes from the social environment, such as family and friends who have both suffered from illness so that they will feel cared for and not alone (Xu et al., 2020). The support system can make it easier for post-COVID-19 patients to adapt to their conditions so that they have high enthusiasm to recover from illness and improve their health status. Thus, with the support system, it is hoped that some post-COVID-19 patients can adapt to their new situation very quickly, without anxiety or negative self-stigma. It is hoped that post-COVID-19 patients can understand the social impact of the COVID-19 pandemic.

4. CONCLUSION

There is a relationship with a negative correlation between age and the support system and the quality of life of post-COVID-19 patients. Other test results, there is not relationship between family knowledge and the support system and the quality of life of patients after COVID-19, but there is a relationship between attitudes and behavior of families with the support system and quality of life of patients after COVID-19. There is a relationship with a positive correlation between the support system and the quality of life and the health status of post-COVID-19 patients. The support system provided to people with various determinants when facing the situation after the coronavirus pandemic is very important in improving the physical and psychological dimensions. A good support system can reduce various forms of stress, improve coping mechanisms and improve the quality of life of post-COVID-19 patients.

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