

ORIGINAL ARTICLE

Determinants of Quality of Life in Patients With Chronic Kidney Disease: A Structural Equation Modeling Approach

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ABSTRACT

Introduction: Chronic kidney disease (CKD) has become a major public health issue around the world. Little is known about the health-related quality of life of Indonesians living with chronic kidney disease, or the physiological and psychosocial factors that have the greatest impact. The goal of this study was to find out what factors affected patients with chronic kidney disease's quality of life, such as family support, anxiety, and coping mechanisms. **Methods:** This research is a cross-sectional study. The population is chronic kidney disease patients undergoing hemodialysis for March-June 2021, with a total sample of 110. Respondents answered a questionnaire including socio-demographic, World Health Organization's Quality of Life-BREF (WHOQOL_BREF), State-Trait Anxiety Inventory (STAI), Coping Orientation to Problem Experienced (COPE), Perceived Social Support- Family (PSS-Fa) Scale. Path analysis is used to determine the direct and indirect effect of the independent variable on the dependent variable. **Results:** Quality of life is directly influenced by family support ($b=0.221$, $p=0.008$), anxiety ($b=-0.303$, $p=0.000$), coping mechanisms ($b=360$, $p=0.000$). Quality of life is influenced indirectly by family support through anxiety dan coping mechanisms. Anxiety has an indirect effect on the quality of life through coping mechanisms. **Conclusion:** Family support, anxiety, and coping mechanisms can improve the quality of life of chronic kidney disease patients.

Keywords: Quality of life, Family support, Anxiety, Coping strategy, Path analysis

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INTRODUCTION

Chronic kidney disease (CKD) has become a significant health problem worldwide. Apart from being a risk factor for heart and blood vessel disease, it increases morbidity and mortality from non-infectious diseases (1). The National Kidney Foundation (2018) as reported that 10% of the world's population has CKD (2). Xie et al. (2018) stated that the global prevalence of CKD increased by 86.95% from 147,598,152 cases in 1990 to 275,929,799 cases in 2016, the global population mortality rate due to this disease has increased by 98.02% from 599,200 deaths in 1990 to 1,186,560 deaths in 2016 (3). In Indonesia in 2018, the prevalence of CKD was 499,800 people (2%); the highest prevalence was in Maluku, with 4351 people (0.47%) experiencing

CKD (4). CKD patients undergoing hemodialysis increased to 77,892 patients (5).

CKD patients are usually programmed to undergo the hemodialysis process one to three times a week. Each time it takes 2-5 hours, this activity will continue throughout their lives. Patients and their families must change their lifestyles to adapt to the conditions during the hemodialysis process. Changes to psychological conditions will appear, such as feeling worried, frustrated, guilty, depressed, and afraid of facing death because they have to do hemodialysis regularly in their lives. Eventually, it will interfere with the quality of life of the patient himself (9,10). QOL is an important parameter that needs to be considered in chronic diseases such as CKD. Several studies have shown that patients with CKD who undergo hemodialysis have a lower QOL than those who do not (11,12). The World Health Organization states that quality of life is an individual's perception of his abilities, limitations, symptoms, and psychosocial characteristics in the context

of culture and value systems to carry out his roles and functions (13).

Several factors affect the quality of life of CKD patients, one of which is anxiety. Anxiety is an individual response to an unpleasant situation experienced by all living things in everyday life. The patient's response to hemodialysis differs depending on how the individual adapts to hemodialysis, which is a source of a stressor for the individual. Kidney failure patients undergoing hemodialysis experience changes in their quality of life, so patients need to adjust to their physical condition. Failure to adjust will cause anxiety that will affect the quality of life. Patients undergoing hemodialysis with high levels of anxiety are often reported to have decreased quality of life from physical, mental, social, and environmental aspects (14). Coping mechanisms are positive predictors of quality of life (15). Individual involvement through coping mechanisms to overcome problems caused by CKD is essential for both short-term and long-term improvements. In this case, hemodialysis patients use various ways to overcome their problems, especially in carrying out the HD process, various non-pharmacological treatments, and doing physical activity.

Another factor that affects the quality of life of CKD patients is family support. The role of the family is significant for every aspect of health care for family members. Family support for patients with chronic renal failure could be in the form of instrumental, informational, emotional, and appreciation. This family support is given throughout the patient's life in supporting the patient's healing (16). According to Ni'mah and Alvita (2017), family support is the support that can be provided by the family where the family functions as a collector and disseminator of information needed by CKD patients (17). So that, in the end, it will have an impact on improving the quality of daily life (18). The role of coping mechanisms, anxiety, and family support will simultaneously have a significant effect on improving patients' quality of life with chronic kidney disease. In addition, these three factors have a direct and indirect influence on the quality of life. The purpose of this study was to determine factors that affected the quality of life, including family support, anxiety, and coping mechanisms among patients with chronic kidney disease.

MATERIALS AND METHODS

Study Design

This study was applied a cross-sectional study design conducted at a private hospital in Sukabumi, West Java, Indonesia, from March-June 2021. Ethical permission was obtained before data collection (KE/340/STIKep/PPNI/JBR/2021)

Sample

The study population was patients with chronic kidney failure undergoing hemodialysis with a total sample of 110. The inclusion criteria for this study are patients with a confirmed diagnosis of chronic kidney disease, or CKD, who can communicate effectively, had a routine hemodialysis for at least six months and who live with family. The exclusion criteria were patients with mental and cognitive disability and severe of complication.

Instrument

QoL was assessed using the World Health Organization's Quality of Life-BREF (WHOQOL_BREF). The WHOQOL-BREF scale represents four domains: 'Physical Health'—7 items (Pain and Discomfort; Dependence on Medications and Medical Aids; Energy, Fatigue, Mobility, Sleep; Activities of Daily Living and Work Capacity); 'Psychological Health'—6 items (Positive feelings; Spirituality/Personal Beliefs; Thinking, Learning, Memory and Concentration; Bodily Image; Self-Este. On a 1–5 Likert scale, 1 is the least agreeable and 5 is the most, each item receives a score from 1 to 5. It is possible to revert items 3, 4, and 26 in the course of analysis. A person's overall perception of health and well-being can be gauged by looking at their responses to two questions about their overall quality of life. A domain's average score is used to calculate the final score for each item on the test. Results for the domain are the sum of the individual items. It is the sum of points that represents the quality of life in a domain. In the current study, the Cronbach's Alpha was 0.88, indicating good reliability index.

Anxiety questionnaire using State-Trait Anxiety Inventory (STAI). The STAI is a 40-question self-report inventory based on a Likert scale with a 4-point range. State anxiety, or anxiety about a specific event, is assessed using the STAI, while trait anxiety refers to one's overall level of anxiety. Higher score indicated higher coping mechanism. In the current study, the Cronbach's Alpha was 0.85, indicating good reliability index.

The coping mechanism questionnaire using Coping Orientation to Problem Experienced (COPE). The COPE has a 28-item self-report questionnaire that assesses how well people cope with stressful life events and how well they fail to cope. This was a Likert scale ranged from 1 (I haven't been doing this at all) to 4 (I've been doing this a lot). Higher score indicated higher coping mechanism. In the current study, the Cronbach's Alpha was 0.76, indicating good reliability index.

Family support questionnaire using Perceived Social Support- Family (PSS-Fa) Scale. Statements such as "Yes," "No," or "Don't know" were included in

each of the scale's 20 items. Each item was scored as +1 if the response indicated that the respondent had a high level of perceived social support, which ranged from 0 (no support) to 20 (maximum support). There is no "I don't know" category. In the current study, the Cronbach's Alpha was 0.81, indicating good reliability index.

Data analysis

Data analysis in this study used descriptive statistical analysis to describe each category of respondent characteristics in the form of socio-demographic data. Descriptive analysis is also used for univariate analysis of research variables, including family support, anxiety, coping mechanisms, and quality of life variables. Inferential statistical analysis was used path analysis.

RESULTS

The majority of respondents aged 46 -65 years are 65 people (59.1%), male sex is 59 people (53.6%), married status is 102 people (92.7%), educated 46 people (41.8%), did not work as many as 63 people (57.3%), undergoing hemodialysis 1-3 years as 53 people (48.2%), long-suffering from chronic kidney failure 1-3 years as many as 53 people (48.2%), and all respondents living with their families as many as 110 people (100%) (Table I).

The average value of family support is 39.94 (8.279); on anxiety, an average value is 86.45 (SD=15.085). On coping mechanisms, an average value is 88.19 (SD=8.417), on quality of life obtained an average value of 77.97 (SD=12.323) (Table II). Family support has an indirect effect on the quality of life through coping mechanisms ($b=0.126$), anxiety ($b=-0.094$), through anxiety and coping mechanisms (0.024). At the same time, anxiety indirectly affects the quality of life through coping mechanisms (0.078) (Table III).

Figure 1 shows that the coping mechanism has a direct effect on the quality of life ($b=0.221$, $p=0.008$), coping mechanisms ($b=0.351$, $p=0.000$), and anxiety ($r=-0.311$, $p=0.000$). Anxiety also affects the quality of life ($b=0.951$, $p=0.001$), and coping mechanisms directly affect the quality of life ($b=0.360$, $p=0.000$).

Table II : Univariate analysis of research variables

Variable	Mean	SD	Minimum	Maximum
Family Support	39.94	8.279	25	54
Anxiety	86.45	15.085	55	104
Coping Mechanism	88.19	8.417	70	103
Quality of Life	77.97	12.32	55	97

Table I : Characteristics of respondents (n=110)

Characteristics	n	%
Age		
17-25	7	6,4
26-45	29	26,4
46-65	65	59,1
>65	9	8,2
Gender		
Female	51	46,4
Male	59	53,6
Marital Status		
Single	102	92,7
Married	8	7,3
Education		
Primary School	23	20,9
Junior High School	25	22,7
Senior High School	46	41,8
College	16	14,5
Job Status		
Unemployed	63	57,3
Employed	47	42,7
Duration of Hemodialysis		
<1 Year	28	25,5
1-3 Year	53	48,2
>3 Year	29	26,4
Duration of being diagnosed with CKD		
<3 Year	40	36,4
3-5 Year	49	44,5
>5 Year	21	19,1

Table III : Direct effect, indirect effect and total effect of independent variables on quality of life of chronic kidney failure

Variables	Direct Effect	p-value	Indirect Effect	Total Effect
Family Support	0.221	0.008	(0,351x0,360)	0.244
Anxiety	-0.303	0.000	+(-0,311x-0,303)+(-0,311x-0,218x0,360)	-0.381
Coping Mechanism	0.360	0.000	(-0,218x0,360)	0.360

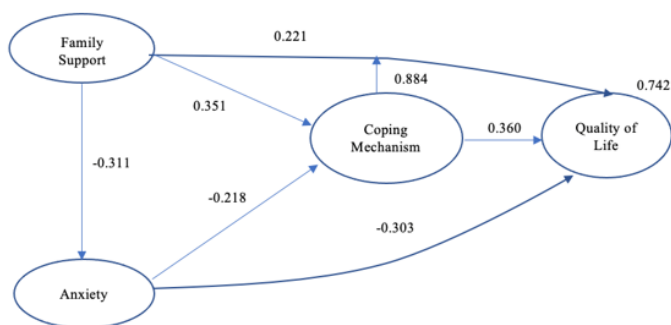


Figure 1. Path analysis model of quality-of-life chronic kidney failure

Figure 1 : Path analysis model of quality-of-life chronic kidney failure.

DISCUSSION

This study demonstrates that family support has a direct effect on the quality of life. These results align with previous studies that found a relationship between family support and quality of life (19)(20). Patients with the chronic renal disease face biological and psychological changes that can impact their quality of life. Patients are more motivated to maintain their health status and improve their quality of life when they receive support from their relatives (21). Friedman et al. (2014) stated a strong relationship between the family and the health status of its members where the role of the family is significant for every aspect of health care for family members, from strategies to the rehabilitation phase (22). Family support can directly reduce stress caused by illness and indirectly improve an individual’s or family’s health. Family support is viewed as something that may be gained from the family, social environment, and health team, with chronic kidney failure patients undergoing hemodialysis therapy believing that individuals who provide family support are willing to assist and aid if needed.

The findings indicated that anxiety directly or indirectly affects the quality of life of chronic kidney disease (CKD) patients receiving hemodialysis. The findings of this study corroborate the previous study that indicated that family support has a significant effect on patients’ quality of life with chronic renal disease (23). Patients with chronic kidney disease who are undergoing dialysis must adjust to their new physical condition. Inability to adapt can create anxiety and lower quality of life. (14). The study found that those with significant anxiety have a lower quality of life. Anxiety can influence changes in behavior patterns. Anxiety during hemodialysis might affect the patient’s health and reduce their quality of life (24).

The findings indicated that coping mechanisms affect the quality of life of individuals with chronic kidney disease. The study’s findings corroborate those of Akbar et al. (2018), who found that coping methods affected the quality of life. Patients with strong coping skills will have a better understanding of the importance and benefits of hemodialysis and the hazards associated with it, enabling them to adjust successfully and eventually enhance their quality of life (25). Reaction to disease and the coping strategies used by individuals are essential factors that must be considered to improve patients’ health and quality of life (26). Coping mechanisms are ways for individuals to solve problems, adjust to changes, respond to threatening situations, which can be in the form of adaptive and maladaptive coping mechanisms depending on how individuals deal with the problem (27). If this coping mechanism is successfully carried out, a person will adapt to the changes or burdens they face. An excellent coping mechanism will show hope for a health condition and adapt to physical, psychological, environmental, and social changes.

Conversely, patients with kidney failure who use maladaptive coping mechanisms will impact psychosomatic disorders that aggravate the health condition of patients with kidney failure. For this

reason, excellent and positive coping mechanisms and expectations can improve the quality of life of patients with kidney failure (28). A person will be able to adjust to the changes or burdens they confront if this coping method is successfully implemented. A healthy coping system may adapt to changes in the physical, psychological, environmental, and social worlds. Conversely, patients with renal failure who utilize maladaptive coping techniques will suffer from psychosomatic diseases that worsen their situation. Thus, positive coping strategies and expectations can improve the quality of life of kidney failure patients (29).

There are several limitations to our study. To begin, our observational study design is a constraint. As a result, additional longitudinal research is required to demonstrate causality. Second, because the surveys were only completed at one institution, generalizability may be limited. Numerous studies have indicated that people with diabetes mellitus, hypertension, cardiovascular disease, rheumatoid arthritis, and ankylosing spondylitis have a lower quality of life than healthy controls. Thus, comorbidities and their consequences may be a significant limitation of our study.

CONCLUSION

Family support, anxiety, and coping mechanisms have significant association with quality of life. This research impacts the development of nursing, especially in dealing with family support, anxiety, coping mechanisms, and quality of life in chronic kidney disease patients. Research has proven that the three variables significantly improve quality of life. These findings underscore that healthcare professionals should initially evaluate family support, anxiety, and coping strategies by analyzing questionnaires related to these areas.

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