

Research Article

Patient Engagement and Self-Efficacy Effects on Quality of Life, the Mediating Role of Accessibility

Aulia Putri Evindra^{1*}, Kemala Rita², Sandra Dewi³

¹ Master of Hospital Administration, Universitas Esa Unggul; Jakarta, Indonesia, e-mail : auliaputrievindra@student.esaunggul.ac.id

² Master of Hospital Administration, Universitas Esa Unggul; Jakarta, Indonesia, e-mail: : kemala.rita@esaunggul.ac.id

³ Master of Hospital Administration, Universitas Esa Unggul; Jakarta, Indonesia, e-mail: : sandra.dewi@esaunggul.ac.id

* Corresponding Author : Aulia Putri Evindra

Abstract: Chronic Kidney Disease (CKD) is a growing global health concern that significantly affects patients' quality of life. At Bhakti Asih General Hospital, Tangerang, the number of hemodialysis patients increased by 20.42% and dialysis procedures by 25.06% between 2023 and 2024. Despite this service expansion, preliminary findings revealed that 32% of patients reported poor quality of life, 31% experienced low engagement in care, 34% demonstrated low self-efficacy particularly in dietary and fluid management and 32% faced accessibility barriers. These findings indicate a gap between increased service volume and patient-centered outcomes. This study aimed to analyze the effects of patient engagement and self-efficacy on the quality of life of hemodialysis patients, with healthcare accessibility as a mediating variable. A quantitative cross-sectional design was employed. Active hemodialysis patients were selected using purposive sampling. Data were collected through structured questionnaires and analyzed using Structural Equation Modeling (SEM). The results demonstrated that patient engagement and self-efficacy had significant positive effects on quality of life, both directly and indirectly through accessibility. Accessibility also significantly influenced quality of life and strengthened the relationships between patient engagement, self-efficacy, and quality of life. These findings highlight the importance of integrating patient engagement strategies, strengthening self-efficacy through education, and improving service accessibility to enhance quality of life among hemodialysis patients

Keywords: Accessibility ; Hemodialysis ; Patient Engagement; Quality Life; Self-efficacy.

1. Introduction

Chronic Kidney Disease (CKD) is a major global health problem with a continuously increasing prevalence each year. Globally, CKD affects approximately 10% of the population and significantly contributes to the burden of chronic diseases. In Indonesia, the number of patients undergoing hemodialysis has increased by nearly 200% over the past five years (IRR, 2020). This trend presents significant challenges for healthcare systems, particularly in maintaining the quality of life of patients who require long-term therapy.

Data from the Basic Health Research (Riskesdas) indicate that CKD cases in Indonesia have reached 713,783 individuals, with 33,587 cases reported in Banten Province. At Bhakti Asih General Hospital, the number of hemodialysis patients increased from 1,232 in 2023 to 1,484 in 2024, representing a 20.42% increase (Kemenkes RI, 2018). Additionally, the number of hemodialysis procedures rose by 25.06%, from 9,314 in 2023 to 11,556 in 2024. This increase reflects a growing service burden and highlights the need for more effective healthcare management.

Hemodialysis is a primary treatment for CKD patients that must be performed regularly throughout the patient's lifetime. Patients typically undergo treatment two to three times per week, with each session lasting three to four hours, significantly limiting daily activities and negatively affecting their quality of life. Furthermore, patients often experience complications

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such as fatigue, sleep disturbances, malnutrition, pain, and depression (Dąbrowska-Bender et al., 2018).

Quality of life is defined as an individual's perception of their position in life within the context of culture, value systems, goals, expectations, and concerns. This definition implies that quality of life is not solely determined by medical conditions but also by psychosocial factors and healthcare system support. Therefore, hospitals need to consider various determinants that influence patients' quality of life, including patient engagement in their care.

Patient engagement is a critical factor in improving healthcare quality. The World Health Organization, defines patient engagement as a process that empowers patients to actively participate in their care to enhance safety, quality, and patient-centered services. In addition, self-efficacy plays an important role, as an individual's belief in their ability to manage their health condition influences treatment adherence and overall quality of life (Bandura, 1997).

Beyond individual factors, accessibility to healthcare services is another essential determinant. Accessibility refers to the degree of fit between healthcare services and patient needs, including availability of facilities, distance, waiting time, financial capability, and cultural barriers (Penchansky & Thomas, 1981). Griva et al. (2018) found that limited access to dialysis services is associated with lower quality of life due to treatment irregularities and increased physical and psychological burden.

A preliminary study conducted at Bhakti Asih General Hospital revealed that the quality of life among hemodialysis patients remains relatively low, with 32% of respondents reporting quality of life issues. Additionally, 31% of patients reported low involvement in their care, 34% had low self-efficacy, and 32% experienced difficulties in accessing healthcare services. These findings indicate that patient engagement, self-efficacy, and accessibility are key factors influencing the quality of life of hemodialysis patients. Therefore, this study aims to analyze the effect of patient engagement and self-efficacy on quality of life, with accessibility as a mediating variable.

2. Preliminaries or Related Work or Literature Review

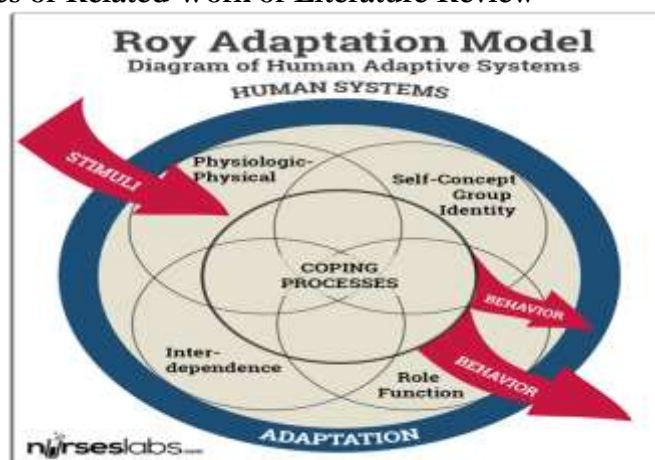


Figure 1. Roy Adaptation Model.

Quality of Life of Hemodialysis Patients

Quality of life in hemodialysis patients is a multidimensional concept that reflects individuals' physical, psychological, social, and environmental conditions. From the perspective of Roy's Adaptation Model, quality of life is viewed as the outcome of human adaptive processes in response to various internal and external stimuli (Roy, 1974). This definition is consistent with the World Health Organization (1997), which defines quality of life as an individual's subjective perception of their position in life within the context of culture, value systems, goals, expectations, and concerns. Furthermore, the models proposed by Wilson & Cleary (1995) and Ferrans & Powers (1992) emphasize that quality of life integrates clinical aspects, functional status, health perceptions, and overall life satisfaction.

In this study, the quality of life of hemodialysis patients is assessed using four main dimensions based on Roy's Adaptation Model: physiological-physical mode, self-concept, role function, and interdependence (Roy, 1974). The physiological-physical mode includes

nutritional balance, fluid regulation, rest, and the ability to perform daily activities. The self-concept dimension relates to patients' acceptance of their illness and their level of self-confidence. Meanwhile, the role function dimension focuses on the individual's ability to fulfill social and economic roles, and the interdependence dimension emphasizes social support, including relationships with family members and fellow patients.

Within Roy's framework, quality of life is influenced by two main components: stimuli and coping processes. Stimuli consist of focal stimuli as the primary factors directly affecting the individual, contextual stimuli as supporting factors that influence adaptive responses, and residual stimuli whose effects are not yet clearly understood (Roy, 1974). In hemodialysis patients, these stimuli may include chronic illness conditions, healthcare environments, and social factors that affect their ability to adapt to long-term therapy.

Coping processes are divided into two subsystems: regulator and cognator. The regulator subsystem refers to automatic physiological mechanisms involving neural, hormonal, and chemical responses that maintain homeostasis. In contrast, the cognator subsystem represents psychosocial mechanisms involving cognitive, emotional, and social processes such as perception, learning, and decision-making (Roy, 1974). Based on this theoretical synthesis, this study adopts Roy's (1974) approach by conceptualizing quality of life as the outcome of adaptive processes reflected in physical, psychological, social, and interdependent balance.

Patient Engagement

Patient engagement is defined as a process of building the capacity of patients, families, caregivers, and healthcare providers to facilitate and support patients' active involvement in their own care, with the aim of improving safety, quality, and people-centered health services. This concept has become an integral component of modern healthcare, emphasizing that patients who are actively engaged are better able to make informed decisions and contribute to more effective use of healthcare resources. Furthermore, Graffigna et al. (2016) conceptualize patient engagement as a psychosocial process that reflects patients' emotional and cognitive development in coping with chronic illness, enabling them to maintain life goals and meaning despite their condition.

From a patient-centered care perspective, engagement is closely associated with recognizing patients as unique individuals with distinct values, preferences, and life experiences (Mead & Bower, 2000). Effective patient engagement requires open, two-way communication and a strong therapeutic relationship between patients and healthcare providers. In addition, Hibbard et al. (2004) emphasize that patient engagement involves the level of motivation, knowledge, skills, and confidence (self-efficacy) that patients possess to manage their health effectively. Thus, engagement extends beyond passive participation, highlighting the patient's active role in monitoring, decision-making, and long-term disease management, particularly in chronic conditions such as hemodialysis.

In this study, patient engagement is operationalized based on the WHO (2016) framework, which includes six key dimensions: capacity building, effective communication, shared decision-making, supportive environment, respect and dignity, and health system responsiveness. Capacity building focuses on enhancing patients' knowledge and self-management abilities; effective communication ensures clear and understandable information exchange; shared decision-making involves patients in care-related decisions; the environment dimension emphasizes supportive and patient-friendly systems; respect and dignity ensure non-discriminatory and culturally sensitive care; and health system responsiveness reflects the system's ability to respond promptly and effectively to patient needs. These dimensions collectively provide a comprehensive framework for assessing patient engagement in healthcare settings.

Self-Efficacy

Self-efficacy is defined as an individual's belief in their ability to organize and execute actions required to achieve specific outcomes (Bandura, 1997). This concept emphasizes that success is not solely determined by objective ability, but also by the extent to which individuals believe they can effectively utilize their capabilities. Self-efficacy plays a crucial role in shaping how individuals think, feel, motivate themselves, and behave. Individuals with high self-efficacy tend to set challenging goals, persist in the face of difficulties, and demonstrate resilience under pressure, whereas those with low self-efficacy are more likely to doubt their abilities, avoid challenges, and give up easily. In the context of chronic illness such as chronic kidney

disease requiring hemodialysis, self-efficacy is essential for maintaining treatment adherence, managing diet and fluid intake, and sustaining quality of life.

Several theoretical perspectives support the importance of self-efficacy in health behavior. Santrock et al. (2014) highlights that self-efficacy is closely linked to self-belief in one's ability to perform tasks successfully, influencing motivation and effort. Becker (1974), through the Health Belief Model, suggest that individuals are more likely to engage in health behaviors if they believe they are capable of performing them.. Pender et al. (2006), in the Health Promotion Model, identifies self-efficacy as a key cognitive factor affecting health behavior choices, effort, and persistence. In hemodialysis patients, higher self-efficacy is associated with better compliance with treatment regimens and healthier lifestyle behaviors, ultimately contributing to improved quality of life.

According to Bandura (1997), self-efficacy consists of three main dimensions: magnitude, generality, and strength. Magnitude refers to an individual's confidence in performing tasks of varying difficulty levels, such as adhering to complex treatment regimens in hemodialysis care. Generality reflects the extent to which self-efficacy beliefs apply across different situations, including maintaining positive attitudes and social interactions. Strength indicates the level of persistence and consistency in maintaining these beliefs despite challenges. Based on this theoretical synthesis, this study adopts Bandura's (1997) framework, conceptualizing self-efficacy as an individual's belief in their ability to perform necessary actions to achieve desired outcomes across the dimensions of magnitude, generality, and strength.

Service Accessibility

Accessibility of healthcare services is defined as the degree of fit between patients' needs and characteristics and the healthcare system's capacity to provide services (Penchansky & Thomas, 1981). This concept extends beyond physical access to include multiple dimensions that determine whether healthcare services can effectively meet patient needs. Accessibility reflects the interaction between service users and providers, where the quality of this interaction influences service utilization and outcomes. Penchansky & Thomas introduced the "Five A's" framework availability, accessibility, affordability, acceptability, and accommodation which ensures that healthcare services are not only reachable but also appropriate, affordable, culturally acceptable, and well-organized.

Other theoretical perspectives further enrich the understanding of healthcare accessibility. Andersen (1995) conceptualizes access as the result of interactions among predisposing, enabling, and need factors that influence healthcare utilization. Joseph & Phillips (1984) emphasize the spatial dimension of accessibility, highlighting the importance of distance, travel time, and distribution of healthcare facilities. Similarly, Levesque et al. (2013) propose a comprehensive model that integrates health system characteristics with patients' abilities, including the ability to perceive, seek, reach, pay for, and engage with healthcare services.. These perspectives are particularly relevant for patients with chronic kidney disease undergoing hemodialysis, who require regular and continuous access to healthcare services.

In this study, healthcare accessibility is operationalized based on the Five Dimensions of Access framework proposed by Penchansky & Thomas (1981), consisting of availability, accessibility, accommodation, affordability, and acceptability. Availability refers to the adequacy of healthcare resources such as personnel and medical equipment. Accessibility relates to geographic distance and transportation ease. Accommodation concerns the organization of services, including waiting time and appointment systems. Affordability reflects patients' financial capacity to access care, while acceptability refers to patients' perceptions of service quality, including provider attitudes and comfort during care. Based on this theoretical synthesis, accessibility is conceptualized as the alignment between patient needs, resources, and perceptions with healthcare system capacity, location, organization, and cost, which collectively determine effective healthcare utilization.

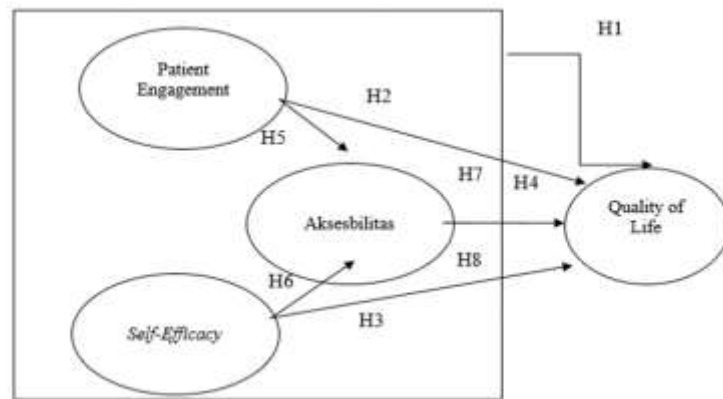


Figure 2. Conceptual Framework

3. Proposed Method

This study used a quantitative approach, with a population of 1,232 hemodialysis patients at Bhakti Asih General Hospital (Firdaus, 2021). The sample was determined using a purposive sampling technique. The inclusion criteria were patients undergoing hemodialysis, willing to participate, and having undergone at least one hemodialysis procedure. The exclusion criteria were patients who were unable to communicate effectively. The sample size was determined based on the approach of J. Hair et al. (2021), which was five times the number of indicators, resulting in a total of 125 respondents.

Data collection was conducted using a questionnaire that had been tested for validity and reliability. The data collection process lasted one month, with direct distribution to eligible respondents. The collected data were then verified before further analysis using Structural Equation Modeling based on Partial Least Squares (SEM-PLS).

4. Results and Discussion

Respondent Characteristics

Most (66%) of respondents were women, the largest age group was in the 51-60 years age group (37%), most of the education was high school/equivalent (45%), most of the respondents were unemployed (44%), in the category of patient payment guarantee using BPJS (100%), and all patients had visited more than 1x (100%). In the category of patients undergoing hemodialysis for a long time, most of the patients had undergone hemodialysis therapy in the range of 3-5 years, namely 47 respondents (38%). Furthermore, patients with a hemodialysis duration of 1-2 years numbered 40 respondents (32%), while patients who had undergone hemodialysis for more than 5 years were 38 respondents (30%).

Convergent Validity Test

The loading factor values for quality of life ranged from 0.797 to 0.888. The loading factor values for patient engagement ranged from 0.842 to 0.908. Self-efficacy had a loading factor value ranging from 0.820 to 0.890. Accessibility had a loading factor value between 0.760 and 0.869. Therefore, all items in the table above are declared valid.

Tabel 1. Average Variance Extracted Test Result .

Variabel	(AVE)	Validitas
<i>Quality of Life</i>	0.687	Valid
<i>Patient Engagement</i>	0.732	Valid
<i>Self-Efficacy</i>	0.769	Valid
<i>Aksesibilitas</i>	0.719	Valid

Source: Results of Primary Data Analysis, 2025.

An AVE value > 0.5 indicates that the research variables are valid. All variables in this study are considered valid and can be processed in further analysis. The AVE (Average Variant Extracted) value is presented because it indicates the validity of each variable, such as Employee Engagement, Transformational Leadership, High Performance Work System, and Perceived Organizational Support. This differs from the loading factor used to assess the validity of each questionnaire item.

Reliability Test

Reliability testing is conducted to ensure that the research instrument used has a good level of internal consistency in measuring each construct. Reliability indicates the extent to which the items within a variable are able to produce stable and consistent results when measurements are repeated. In this study, reliability is assessed by examining the values of Cronbach's Alpha, rho_A, and Composite Reliability (CR). A construct is considered reliable if the values of Cronbach's Alpha and Composite Reliability are greater than 0.70 (J. F. Hair et al., 2022).

Tabel 2. Realibility Test.

Variable	Cronbach's Alpha	Rho_A	Composite Reliability	Description
Aksesibilitas	0.976	0.977	0.978	Reliabel
Quality of Life	0.976	0.976	0.978	Reliabel
Patient Engagement	0.973	0.974	0.976	Reliabel
Self-Efficacy	0.964	0.966	0.968	Reliabel

Source: Results of Primary Data Analysis, 2025.

Based on the table above, it can be seen that the variables quality of life, patient engagement, self-efficacy, and accessibility have composite reliability and Cronbach's alpha values >0.70 , thus concluding that all constructs meet the required reliability. Based on the overall validity and reliability test results for the outer model, it was concluded that all indicators are valid and reliable in measuring their constructs, allowing testing to proceed to the next stage, namely testing the inner model.

Hypotesis Test

Hypothesis Testing Results – The research data were processed using SmartPLS.

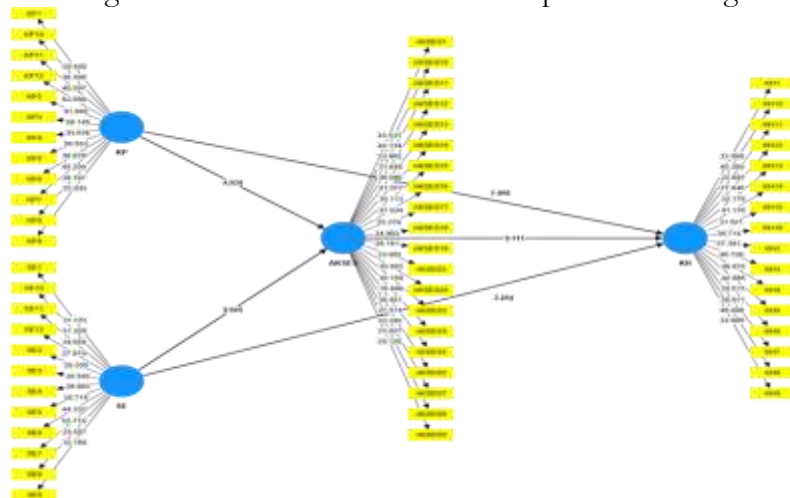


Figure 3. Bootstrapping Analysis Results.

The figure above shows valid item results with a statistical T value of ≥ 1.96 . This shows that patient involvement, self-efficacy, and accessibility significantly influence the quality of life of hemodialysis patients.

Simultaneous Test

Tabel 3. Simultaneous Effects Test Results.

	Sum square	df	Mean square	F	P value	Hipotesis
Total	94.864	133	0	0		
Residual	27.306	130	0.21	0	0,000	H1: Accepted
Regression	67.558	3	22.519	107.212		

In the table above, the P-value is 0.000, and the calculated F-value is 107.212, while the F-table value for the number of respondents is 125 with 3 independent variables and a probability of 0.05 is 2.67. Therefore, it can be concluded that there is a simultaneous influence between patient involvement, self-efficacy, and accessibility on quality of life

Partial Hypothesis

Tabel 4. Partial Hypotesis Test (Indirect Effect).

	<i>Original</i>	<i>T</i>	<i>P</i>	Description
	<i>Sample</i>	<i>Statistics</i>	<i>Values</i>	
KP→ KH	0.375	7.468	0.000	H2 Accepted
SE → KH	0.192	3.254	0.001	H3 Accepted
AK→ KH	0.491	9.111	0.000	H4 Accepted
KP→ AK	0.340	4.939	0.000	H5 Accepted
SE → AK	0.354	4.925	0.000	H6 Accepted

Source: Results of Primary Data Analysis, 2025

Based on the results of the direct relationship analysis, patient engagement (X1) has a positive and significant effect on quality of life (Y) with a path coefficient of 0.375 ($T = 7.468$; $p < 0.05$). Similarly, self-efficacy (X2) also shows a positive and significant effect on quality of life with a coefficient of 0.192 ($T = 3.254$; $p < 0.05$). Accessibility (Z) demonstrates the strongest positive influence on quality of life, with a path coefficient of 0.491 ($T = 9.111$; $p < 0.05$). These findings indicate that improvements in patient engagement, self-efficacy, and accessibility are associated with better quality of life among patients.

Furthermore, patient engagement (X1) and self-efficacy (X2) both have positive and significant effects on accessibility (Z). Patient engagement has a path coefficient of 0.340 ($T = 4.939$; $p < 0.05$), while self-efficacy has a coefficient of 0.354 ($T = 4.925$; $p < 0.05$). This suggests that higher levels of patient engagement and self-efficacy contribute to better perceived accessibility, which in turn supports improvements in patients' quality of life.

Indirect Effect Hypothesis Test

Tabel 4. Indirect Effect Hypothesis Test.

	<i>Original</i>	<i>T</i>	<i>P</i>	Description
	<i>Sample</i>	<i>Statistics</i>	<i>Values</i>	
KP → AK → KH	0.167	4.496	0.000	H7 Accepted
SE → AK → KH	0.174	4.025	0.000	H8 accepted

Based on the indirect effect analysis, patient engagement (X1) on quality of life (Y) through accessibility (Z) shows a positive and significant effect, with a coefficient of 0.167 ($T = 4.496$; $p < 0.05$). This indicates that accessibility plays a significant mediating role in the relationship between patient engagement and quality of life. In other words, an increase in patient engagement will indirectly improve quality of life through enhanced accessibility.

Similarly, self-efficacy (X2) on quality of life (Y) through accessibility (Z) also demonstrates a positive and significant effect, with a coefficient of 0.174 ($T = 4.025$; $p < 0.05$). These findings suggest that accessibility significantly mediates the relationship between self-efficacy and quality of life. Therefore, higher self-efficacy contributes to improved quality of life indirectly through better accessibility to healthcare services

Discussion

The findings indicate that patient engagement, self-efficacy, and accessibility simultaneously have a significant effect on the quality of life of hemodialysis patients. This

confirms that quality of life is shaped by the interaction of internal and external factors rather than a single determinant. Patient engagement reflects active participation in care, self-efficacy represents an individual's confidence in managing health conditions (Bandura, 1997), and accessibility refers to the alignment between patient needs and healthcare services (Penchansky & Thomas, 1981). These variables operate synergistically to influence patient outcomes. This perspective is also consistent with Roy's Adaptation Model, which views quality of life as an outcome of human adaptation to environmental stimuli (Roy, 1974). Therefore, improving quality of life requires a comprehensive and integrated approach.

The high category of quality of life observed among patients indicates successful adaptation to chronic illness conditions. According to Roy (1974), this reflects a balance across physiological, psychological, and social domains. The strong performance in the role function dimension suggests the presence of substantial social support. This aligns with the WHO, definition of quality of life, which emphasizes the importance of individuals' perceptions of their social environment. Patients who feel supported by family, healthcare providers, and peers tend to have greater motivation to adhere to treatment. Consequently, social support plays a crucial role in maintaining and improving the quality of life of hemodialysis patients.

High levels of patient engagement, particularly in the dimension of respect and dignity, indicate that healthcare services have effectively implemented a patient-centered care approach. According to WHO (2016), patient engagement involves empowering individuals to actively participate in their own care. Similarly, Mead & Bower (2000) highlight that patient-centered care recognizes patients as individuals with unique values and preferences. This approach enhances trust and comfort during treatment. Patients who feel respected are more likely to communicate openly and adhere to medical recommendations. Thus, the humanistic aspect of healthcare delivery significantly contributes to improved quality of life.

Self-efficacy, as an internal factor, plays a vital role in enhancing the quality of life of hemodialysis patients. Bandura (1997) explains that self-efficacy influences how individuals think, behave, and challenges. Patients with high self-efficacy tend to demonstrate stronger motivation and psychological resilience. This is supported by Ajzen's, Theory of Planned Behavior, which suggests that perceived control influences behavioral intentions. Furthermore, Becker (1974) emphasize that individuals with higher confidence in their abilities are more likely to engage in health-promoting behaviors. Therefore, self-efficacy is a key determinant in improving patient outcomes.

Accessibility of healthcare services also significantly contributes to patients' quality of life. Penchansky & Thomas (1981) define accessibility as the degree of fit between healthcare systems and patient needs. Andersen (1995) further explains that access is influenced by predisposing, enabling, and need factors. From a spatial perspective, Joseph & Phillips (1984) highlight the importance of distance and travel time in healthcare utilization. Easy access enables patients to undergo routine hemodialysis without major barriers, reducing both physical and psychological burdens. Thus, accessibility serves as a critical external factor in supporting patient well-being.

The direct effect of patient engagement on quality of life demonstrates that active participation in care improves overall well-being. Graffigna et al. (2016) describe patient engagement as a psychosocial process that supports adaptation to chronic illness. Additionally, Hibbard et al. (2004) emphasize that engagement involves motivation, knowledge, and skills in managing health. Patients who actively participate tend to better understand their condition, which enhances adherence to treatment and improves health outcomes. Therefore, patient engagement is a significant determinant of quality of life in chronic disease management.

Self-efficacy also has a significant positive effect on quality of life. Within the Health Promotion Model, Pender et al. (2006) identifies self-efficacy as a key cognitive factor influencing health behavior. Individuals with higher self-efficacy are more proactive in maintaining their health. Empirical studies by Nguyen et al. (2022) and Pakaya et al. (2021) support this finding, showing that self-efficacy is associated with improved quality of life in hemodialysis patients. Similarly, studies by Putri et al. (2024) confirm this positive relationship. Thus, strengthening self-efficacy is essential for enhancing patient well-being.

Accessibility has a direct influence on quality of life by facilitating easier access to healthcare services. Levesque et al. (2013) describe accessibility as an interaction between healthcare systems and individual capabilities. Haesen et al. (2021) further note that barriers such as cost, distance, and travel time can limit access. Longer travel times to healthcare facilities can reduce the quality of life of hemodialysis patients due to increased physical fatigue, time burden, and psychological stress. In contrast, easier and more convenient access to healthcare services supports better adherence to treatment schedules and contributes to improved overall well-being. Therefore, accessibility plays a critical role in achieving optimal health outcomes.

Accessibility also plays a mediating role in the relationship between patient engagement and quality of life. High patient engagement becomes more effective when supported by accessible healthcare services. Penchansky & Thomas (1981) emphasize that accessibility ensures alignment between patient needs and healthcare systems. Engaged patients tend to have a better ability to navigate healthcare systems effectively. As a result, accessibility functions as a bridging factor that amplifies the impact of patient engagement on health outcomes. This highlights the importance of integrating both internal and external factors in delivering effective healthcare services.

Similarly, accessibility mediates the relationship between self-efficacy and quality of life. Bandura (1997) states that self-efficacy drives individuals to take action and persist in the face of challenges. However, this internal capacity must be supported by an enabling healthcare system (Penchansky & Thomas, 1981). Studies by Nguyen et al. (2022) indicate that self-efficacy yields better outcomes when access to care is adequate. Conversely, barriers such as long travel time can lower patients' quality of life even when they have strong motivation to maintain their health. Therefore, the combination of high self-efficacy and good accessibility is essential to improve the quality of life of hemodialysis patients.

5. Comparison

The findings of this study demonstrate that patient engagement, self-efficacy, and accessibility collectively contribute to improving the quality of life among hemodialysis patients, which is consistent with prior literature. Theoretically, this aligns with Roy's Adaptation Model (1974), which views quality of life as the outcome of an individual's adaptive responses to internal and external stimuli. Patient engagement, as described by WHO (2016), enhances patients' capacity to actively participate in their care, thereby strengthening adaptive coping mechanisms. Conversely, long travel distances and other access barriers can reduce patients' quality of life despite having strong motivation. Therefore, a combination of strong self-efficacy and adequate accessibility is essential to improve the quality of life of hemodialysis patients.

Similarly, the role of self-efficacy as an internal driver is consistent with Bandura's theory (1997), where individuals with higher confidence in their abilities are more resilient and proactive in managing their health. Previous studies Nguyen et al. (2022; Pakaya et al., 2021; Putri et al., 2024) confirm that self-efficacy positively influences quality of life through improved self-care behaviors. However, this study adds a comparative perspective by demonstrating that accessibility acts as a crucial mediating factor, strengthening the impact of both patient engagement and self-efficacy on quality of life. This finding aligns with Penchansky & Thomas (1981), who emphasize the importance of the "fit" between patient needs and healthcare systems. Compared to earlier research, this study provides a more comprehensive model by integrating psychological (self-efficacy), behavioral (engagement), and structural (accessibility) factors, highlighting that optimal patient outcomes are achieved through the interaction of these dimensions rather than through isolated effects.

6. Conclusions

Based on the results of this study, it can be concluded that patient engagement, self-efficacy, and accessibility simultaneously have a significant effect on the quality of life of hemodialysis patients at RSU Bhakti Asih. These three variables collectively contribute to achieving optimal quality of life, where patient engagement reflects active participation in care, self-efficacy represents confidence in managing health conditions, and accessibility indicates the ease of obtaining healthcare services. In addition, partially, each variable has a positive

and significant effect on quality of life, implying that improvements in patients' quality of life can be achieved through enhancing patient engagement, strengthening self-efficacy, and ensuring accessible and responsive healthcare services.

Furthermore, this study also reveals that patient engagement and self-efficacy have a positive effect on accessibility, and accessibility acts as a mediating variable in the relationship between patient engagement and self-efficacy with quality of life. This indicates that the influence of patient engagement and self-efficacy on quality of life becomes stronger when supported by adequate accessibility of healthcare services. Therefore, efforts to improve the quality of life of hemodialysis patients should not only focus on internal patient factors but also be supported by a healthcare system that provides ease of access, comfort, and patient-centered care in a sustainable manner.

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