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Good health literacy leads to better quality of life and medication adherence among hemodialysis patients

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ABSTRACT

Introduction: In managing their conditions and achieving positive health outcomes, individuals with chronic kidney disease rely on health literacy (HL) as a crucial concept. Sufficient health literacy enables patients to maintain good medication adherence and experience an enhanced quality of life. The research aimed to investigate the correlation between health literacy levels, medication adherence, and quality of life among hemodialysis patients with chronic kidney disease.

Methods: The research employed a cross-sectional design. A random sample of 164 hemodialysis patients from two hemodialysis facilities in Padang, Indonesia, was collected between May and June 2023. Inclusion criteria were patients undergoing hemodialysis twice a week and aged over 18 years. Patients who experienced a decrease in consciousness and memory disorders such as dementia were excluded from this study. The questionnaires used to measure variables in this study were the demographic data questionnaire, the HLS-EU-Q16 health literacy questionnaire, the MMAS-8 medication adherence questionnaire, and the KDQOL-36 quality of life questionnaire for chronic kidney disease patients.

Results: The statistical analysis demonstrated a significant relationship between health literacy, quality of life, and medication adherence (p-value < 0.05). The high health literacy group (N = 73) exhibited a markedly superior quality of life compared to those in the mid-level (N = 48) and low-level (N = 43) health literacy groups. Multiple regression analysis revealed that, of the three components of health literacy, health promotion has the greatest influence on patients' quality of life, contributing 25.1%, while the aspect of healthcare has the greatest influence on medication adherence, contributing 43.3%.

Conclusions: Health literacy is essential in improving medication adherence and the patient's quality of life in a more optimal direction. Healthcare professionals should create plans for tailored and customized health information with the goal of providing patients with the knowledge about critical components they need to manage chronic kidney disease.

Keywords: adherence, CKD, health literacy, quality of life

Introduction

Chronic Kidney Disease (CKD) is a term that medical personnel use to describe damage to the kidneys that lasts more than three months and is progressive. A Glomerular Filtration Rate (GFR) of less than 60 ml/min/1.73 m^2 has implications for a person's health condition (Thomas, 2019). Patients with a GFR of less than 60 mL/min/1.73 m2 begin to experience sleep disorders, weakness, nausea, decreased appetite, and weight loss (Black & Hawks, 2009). This condition is due to the accumulation of toxic waste in the blood,

especially urea (Black & Hawks, 2009). Chronic Kidney Disease (CKD) is a rapidly increasing global health and healthcare burden. Although Indonesia has the lowest prevalence, with 117–540 per million population (pmp) from worldwide statistics (Thurlow et al., 2021), likely due to under-diagnosis, the number of patients undergoing haemodialysis in Indonesia increases every year. In 2018, over 132,000 patients received haemodialysis (Indonesian Renal Registry, 2018).

Hemodialysis is the most commonly used renal replacement therapy modality for CKD patients in Indonesia. The number of patients undergoing routine hemodialysis increased from 2017 to 2018, reaching 132,142 patients in 2018 (Indonesian Renal Registry, 2018). Effective chronic kidney disease management requires medication adherence, with the primary treatment objectives being to delay the course of the disease, monitor and ameliorate disease-related consequences, and treat the underlying etiology (Nielsen et al., 2018). Based on several previous studies, high adherence to medication among chronic kidney disease patients needs to be increased (Karuniawati & Supadmi, 2016; Ozen et al., 2019; Wulandari et al., 2020). Non-compliance with medication in patients results in them not fully benefiting from the prescribed drugs. Medication non-compliance in patients with chronic kidney disease is also associated with an increased risk of premature death and hospitalization. Therefore, medication adherence is critical to effective management in patients with chronic kidney disease (Nagasawa et al., 2018). Previous research conducted by Ozen et al. (2019) on hemodialysis patients in Turkey found a 79.9% non-adherence in medication. According to Browne and Merighi (2010), several factors can influence medication adherence in hemodialysis patients, such as socioeconomic, pill burden, and demographic status, psychosocial factors, health literacy, patient satisfaction, and health beliefs. Health literacy is crucial because low literacy has been associated with worse health outcomes, including increased use of emergency services, hospitalization, and causes of death. In patients with chronic kidney disease, low health literacy has been linked to lower knowledge of kidney disease and higher mortality (Galura & Pai, 2017).

A person's health conditions, quality of life, and medication compliance are all impacted by their level of health literacy (Zheng et al., 2018). Health literacy is "The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions." This definition emphasizes the ability to not only acquire and comprehend health information but also to effectively communicate and apply that information in decision-making(Berkman, Davis and McCormack, 2010). Health literacy is contextual and, by assessing its multiple dimensions, it is more likely to identify the ways healthcare professionals can integrate health literacy in every encounter with patients. In this way, healthcare delivery becomes person-centered rather than disease-centered (Dinh, et al., 2021). Health literacy is seen to be crucial in motivating people to engage in healthcare, develop resiliency, and enhance their health and wellbeing (Qi et al., 2021).

People with end-stage chronic kidney disease have higher mortality rates when they have low health literacy because they know less about renal disease (Galura & Pai, 2017). According to Fatima et al.'s study (2022), there is a correlation between health literacy and medication adherence in patients with end-stage kidney disease, with higher health literacy levels being associated with greater treatment satisfaction and adherence. This is consistent with previous research on the relationship between health literacy and the quality of life of hemodialysis patients conducted by Alemayehu et al. (2019). It backs up the conclusions of the study by Stømer et al. (2020), which demonstrated a link between health literacy and the quality of life of patients with chronic renal disease, with higher health literacy levels being connected to better overall quality of life. Health literacy can serve as a measure for determining one's quality of life: individuals with good health literacy tend to have a higher quality of life, while those with low health literacy have a lower quality of life (Milufa & Wahjuni, 2020).

Suarilah and Lin (2022) reported that Indonesian patients with CKD have low health literacy. Qualitative studies have also shown that patients receiving hemodialysis got inadequate information and that physicians or nurses could not provide clear information (Mailani *et al.*, 2021). Nevertheless, most of these studies have relied on health literacy (HL) assessments that focus solely on measuring reading and numeracy skills related to health. However, in recent years, the notion of HL has expanded beyond a person's literacy and numeracy abilities to include more interactive, social, and vital factors, such as assistance from family and friends, collaboration with medical experts, and the capacity for critical thought (Batterham et al., 2017; Sørensen et al., 2012; van der Heide et al., 2018). Further study is required to acquire a better understanding of the relationships between broader health literacy components and outcomes, including quality of life (QoL) and adherence to long-term treatment, both

generally and specifically among people with chronic kidney disease (CKD). The research aimed to investigate the correlation between health literacy levels, medication adherence, and quality of life among hemodialysis patients with chronic kidney disease. In this study, individuals with CKD and various levels of health literacy had their quality of life (QoL) and adherence to long-term treatment evaluated and compared. The study also aimed to pinpoint the precise health literacy elements that were related to CKD patients' QoL and adherence to long-term treatment.

Materials and Methods

Research design

This study was a descriptive correlation analysis with a cross-sectional design approach intended to determine the association between health literacy level, medication adherence, and quality of life among hemodialysis patients.

Participants

In Padang, Indonesia, 164 hemodialysis patients were randomly selected from two hemodialysis units in two tertiary hospitals. The inclusion criteria included adult patients who were at least 18 years old, frequently had hemodialysis twice per week, and could read and write Indonesian. The exclusion criteria in this study were patients who experienced a decrease in consciousness, a state of weakness and had memory disorders such as dementia.

Research variables

In this research, the variables are Health Literacy, Medication Adherence, and Quality of Life for chronic kidney disease patients undergoing hemodialysis. Health Literacy refers to an individual's ability or skill to access, understand, evaluate, and use health-related information to make judgments and decisions regarding their health. Medication Adherence is the degree to which hemodialysis patients follow their prescribed medication regimens. Quality of Life is the perception of each individual with chronic kidney disease as they navigate their life, potentially influenced by symptoms, perceived effects, disease burden, and both physical and mental health statuses.

Data Collection and Research Instrument

Four questionnaires were employed in the study, together with a demographic characteristics form to gather information about the patients' gender, age, marital status, level of education, duration of hemodialysis, and comorbidities. Understanding the composition of the study population is essential for generalizing the findings to a broader population or specific subgroups. The questionnaires used in this research were on health literacy, medication adherence, and quality of life. All instruments used in the study are standard questionnaires frequently used worldwide. Researchers in Indonesia have also used these questionnaires with good validity and reliability. These instruments have commonly been used in research settings involving CKD patients undergoing hemodialysis. Below is a description of the questionnaires.

Health Literacy

The Health Literacy Survey Europe Questionnaire 16 (HLS-EU-Q16) is used to assess respondents' levels of health literacy. This questionnaire consists of 16 question items and the adaptation process into Indonesian was taken from previous research by Nasriyanto (2018) and has been tested for validity and reliability with a Cronbach's alpha value of 0.849. This questionnaire consists of 16 items divided into three scales: health care (items 1, 2, 3, 4, 5, 6, 7), disease prevention (items 8, 9, 10, 11, 12), and health promotion (items 13, 14, 15, 16), which are related to four dimensions, the capacity to locate, comprehend, evaluate, and use a variety of health information. Each item is rated on a Likert scale from 1 to 4, where 1 represents 'very difficult' and 4 represents 'very easy.' The scoring range of this questionnaire is from 0 to 16, with a minimum score of 0 and a maximum score of 16. A score of 0 is assigned to "very difficult" and "quite difficult" responses, while a score of 1 is assigned to "quite easy" and "very easy" responses. The final score is categorized into three levels: 0-8 is classified as low-level health literacy, 9-12 as mid-level health literacy, and 13-16 as high-level health literacy (Pelikan et al., 2019).

Medication Adherence

A survey called the Morisky Medication Adherence Scale-8 (MMAS-8) is used to gauge how well patients take their medications. This questionnaire consists of eight items, seven of which are yes-or-no questions where "Yes" is scored as 0 and "No" is scored as 1, except for question 5 where "Yes" is scored as 1 and "No" is scored as 0. Question 8 has answer choices on 5-point Likert scale: "never, rarely, sometimes, often, or always," with a score of 1 given for "never." The final assessment is calculated based on the total score and categorized as low adherence for a score <6, moderate adherence for a score of 6-7, and high adherence for a

score of 8. This questionnaire is a standardized instrument whose validity and reliability have been confirmed, with item selection values ranging from 0.305 to 0.463 and a Cronbach's alpha of 0.675, indicating good reliability (Prabowo & Huwae, 2022).

Quality of Life

The RAND Corporation has developed the Kidney Disease and Quality of Life Short Form Questionnaire (KDQOL-36), a questionnaire for evaluating quality of life. This questionnaire is designed to evaluate patients' quality of life with chronic kidney disease. It consists of 36 items representing five dimensions related to the assessment of physical and mental functioning (SF-12), symptoms/problems, the impact of kidney disease on daily life, and the burden of kidney disease. The scores of the KDQOL-36 questionnaire are transformed into a score between 0 to 100, with higher scores reflecting better quality of life (Hays et al., 1994). This questionnaire has been tested for validity and reliability, with Cronbach's alpha values ranging from 0.706 to 0.886 (Supriyadi et al., 2019).

To collect the data, the researcher began by consulting the head nurse to obtain information on the overall count of hemodialysis patients and to provide an overview of the study's objectives and methodology. In the second stage, the head nurses assisted in identifying potential participants who met the inclusion criteria. Additionally, the researchers received support from the hemodialysis unit nurses in identifying individuals who matched the specified sample criteria. The process of collecting data through the completion of questionnaires was as follows: the questionnaires were distributed to the participants in the hospital according to the hemodialysis schedule. The respondents were supported in filling out the questionnaire, but still complying with the research protocol. The filling process took place during hemodialysis sessions, but was adjusted to the condition of the patient. Then, the questionnaire data obtained were recapitulated and analyzed.

Data Analysis

Bivariate and multivariate analysis were used in this study. The data obtained were processed and analyzed using statistical software, and categorical data presented as frequency and percentage. The Chi-square test was performed in the study to see if there is a connection between health literacy and medication adherence. The Kolmogorov-Smirnov test and the Levene test were formerly used to determine whether the data were normal and homogeneous. The data for each variable were not normally distributed. To compare scores on each quality of life dimension in each health literacy category, the Kruskall Wallis test was used where the p-value <0.05 indicates a relationship between the variables tested. The Mann-Whitney test was used as a post hoc test to identify where the

Table 1 Characteristics of Respondents in Total and Based on Each Category of Health Literacy.

Variable	Total group (no = 164)	LL- HL (no = 43)	ML- HL (no = 48)	HiL- HL (no = 73)
Age (Years) (%)				
17-25	6 (3.6)	3 (50.0)	2 (33.3)	1 (16.7)
26-35	7 (4.3)	1 (14.3)	4 (57.1)	2 (28.6)
36-45	31 (18.9)	6 (19.4)	7 (22.6)	18 (58.1)
46-55	49 (29.9)	10 (20.4)	16 (32.7)	23 (46.9)
56-65	51 (31.1)	15 (29.4)	14 (27.5)	22 (43.1)
>65	20 (12.2)	8 (40.0)	5 (25.0)	7(35)
Gender (%)				
Male	89 (54.3)	20 (22.5)	24 (27)	45 (50.6)
Female	75 (45.7)	23 (30.7)	24 (32)	28 (37.3)
Education (%)				
Elementary School	25 (15.2)	14 (56.0)	5 (20.0)	6 (24)
Junior high School	20 (12.2)	8 (40.0)	8 (40.0)	4 (20)
Senior High School	87 (53.1)	20 (23.0)	30 (34.5)	37 (42.5)
University	32 (19.5)	1 (3.1)	5 (15.6)	26 (81.2)
Duration on Hemodialysis (%)				
< 3 months	32 (19.5)	6 (18.8)	15 (46.9)	11 (34.4)
4-12 months	57 (34.7)	16 (28.1)	15 (26.3)	26 (45.6)
>12 months	75 (45.7)	21 (28.0)	18 (24.0)	36 (48)
Comorbid (%)				
None	18 (10.8)	4 (22.2)	4 (22.2)	10 (55.6)
1 Comorbid	88 (53.6)	22 (25.0)	30 (34.1)	36 (40.9)
2 Comorbids	35 (21.3)	6 (17.1)	7 (20.0)	22 (62.9)
>2 Comorbids	23 (14.02)	11 (47.8)	7 (30.4)	5 (21.7)
Job (%)				
Employed	22 (13.4)	5 (22.7)	2 (9.1)	15 (68.2)
Retired	16 (9.7)	2 (12.5)	3 (18.8)	11 (68.8)
Unemployed	44 (26.8)	19 (43.2)	9 (20.5)	16 (36.4)
Stopped due to health reason	82 (50.0)	17 (20.7)	34 (41.5)	31 (37.8)

Note: LL: Low-level; ML: Mid-level; HiL: High-level; HL : Health Literacy

Table 2 The Correlation of Health Literacy with Medication Adherence and Quality of Life

Variable		LL- HL (no = 43)	ML- HL (no = 48)	HiL- HL (no = 73)	p-Value	Compare p-value in different level HL
Medication Adherence	low (*f*) Middle (*f*) High (*f*)	28 (65.1) 11 (25.6) 4 (9.3)	20 (41.7) 15 (31.2) 13 (27.1)	16 (21.9) 22 (30.1) 35 (47.9)	< 0.001*	
Quality Of Life	Dimensions of physical (Mean Rank)	76.40	73.50	92.01	0.068	LL VS ML = not tested LL VS HiL = not tested ML VS HiL = not tested
	Dimensions mental functioning (Mean Rank)	68.16	79.52	92.90	0.022*	LL VS ML = 0.196 LL VS HiL = 0.09* ML VS HiL = 0.106
	Dimensions the burden of kidney disease (Mean Rank)	60.47	80.47	96.82	< 0.001*	LL VS ML = 0.018* LL VS HiL =0.001* ML VS HiL = 0.036*
	Dimension symptoms/problems (Mean Rank)	75.12	71.24	94.25	0.016*	LL VS ML = 0.670 LL VS HiL = 0.034* ML VS HiL = 0.010*
	Dimensions the impact of kidney disease on daily life (Mean Rank)	66.86	81.27	92.52	0.019*	LL VS ML = 0.095 LL VS HiL = 0.008* ML VS HiL = 0.154
	Rerata Keseluruhan (Mean Rank)	63.05	75.40	98.63	< 0.001*	LL VS ML = 0.141 LL VS HiL = 0,001* ML VS HiL = 0,005*

A nonparametric exam was administered to patients with varied levels of health literacy to evaluate their quality of life and adherence to long-term therapy scores. The relationship between health literacy factors and adherence of medication was examined using the chi-square test. The researchers employed the non-parametric Kruskal-Wallis test to examine variations among different health literacy categories, followed by the employed of the Mann-Whitney test as a post hoc analysis to pinpoint specific areas where score differences existed
* Statistically significant (p<0.05)

differences lie in each group tested. The study conducted a Spearman correlation test to examine the relationship between the health literacy scale and both quality of life and medication adherence. Additionally, a multiple linear regression analysis was carried out on the full patient population to identify relationships between the three HLQ scales as independent variables and the dependent components of overall quality of life and medication adherence.

Ethical Consideration

Medical Research Ethics Management of RSUP Dr. M. Djamil Padang granted ethical approval to conduct this research, number: LB.02.02/5.7/254/2023. This investigation was carried out in accordance with an authorized procedure prospective respondents were informed about the goals of the research and provided with the opportunity to give their consent before participating. Respondents had to sign informed consent forms as a declaration that they were willing to take part in the study.

Results

The respondents in this study comprised 164 patients with chronic kidney disease who routinely underwent hemodialysis. Most of the respondents were in the 56-65 years old age group, as many as 51 respondents (31.1%). More than half of the respondents were male, namely 89 respondents (54.3%), the majority of respondents had high school education, namely 87 respondents (53.1%), and 79 respondents (45.7%) had undergone hemodialysis for more than one year. The majority of respondents,88 (53.6%), had one co-morbidity, and most of the respondents had stopped working due to illness as many as 82 respondents (50%). The data can be seen in Table 1.

QOL and Adherence in Patients with Diverse Levels of Health Literacy

The patients were classified into three groups with comparable Health Literacy Questionnaire (HLQ) profiles using Wards' hierarchical cluster analysis. The health literacy levels in patients were categorized into three groups: Low-level, Mid-level, and High-level (Pelikan et al., 2019). There were 43 patients (26.2%) in the low-level group, 73 (44.5%) in the high-level group, and 48 (29.2%) in the mid-level group. Among the 43 respondents with low-level health literacy, 28 respondents (65.1%) had low medication adherence. Among the 48 respondents with mid-level health

Table 3 The Relationship between the Health Literacy Domain, Life Quality, and Medication Adherence

Domain of health literacy	Quality of life correlation coefficient	p	Adherence correlation coefficient	P
Overall health literacy	0.336	< 0.001*	0.425	< 0.001*
Healthcare	0.348	< 0.001*	0.471	< 0.001*
Disease prevention	0.263	0.001*	0.336	< 0.001*
Health promotion	0.266	0.001*	0.308	< 0.001*

Note: *Spearman correlation test, statistically significant at p<0.05

Table 4 Multiple Regression Analysis to Establish the Correlation between the Health Literacy Domain and both Quality of Life and Medication Adherence

Domains HL	Quality of life					Medication Adherence				
	B	SE	β	t	p	B	SE	β	T	p
(Constant)	47.631	2.368		20.117	< 0.001*					
Health promotion	2.501	.759	.251	3.295	0.001*					
(Constant)						3.337	.446		7.490	< 0.001*
Healthcare						.505	.083	.433	6.108	< 0.001*

Note: p-value is the result of the multiple linear regression test
* Statistically significant (p < 0.05).

literacy, 20 (41.7%) had low medication adherence. On the other hand, among the 73 respondents with high-level health literacy, 35 respondents (47.9%) had high medication adherence. In patients with chronic renal disease receiving hemodialysis, the chi-square test's statistical analysis yielded a p-value of 0.001 (p<0.05), demonstrating a substantial correlation between health literacy and medication adherence.

QOL and Adherence Associated with Different Dimensions of Health Literacy

The analysis using Spearman's test yielded substantial correlations between the domain of health literacy and both medication adherence and quality of life, as shown in Table 3 (p<0.05). With a positive direction of correlation, it means that the better the value of health literacy, the better the quality of life and patient compliance. Multiple regression analysis revealed that of the three components of health literacy: health promotion has the greatest influence on patients' quality of life, contributing 25.1%, while the healthcare that has the greatest influence on medication adherence is 43.3% (Table 3 and Table 4).

Discussions

The study findings show a positive correlation between higher health literacy (HL) and enhanced quality of life (QoL), aligning with the health literacy conceptual model proposed by Sorensen et al. (2012). The study also showed that patients with high levels of health literacy closely followed their prescription regimens and closely improved their quality of life. These findings align with some studies that high HL is associated with better QoL (Dodson et al., 2016; Skoumalova et al., 2022; Stømer et al., 2020a). Those studies revealed that those with higher levels of total health literacy had better physical and mental health than those with lower levels of total health literacy. Patients with lower levels of HL tend to have lower educational attainment, more comorbidities, increased medication intake, and higher levels of depressive symptoms, all of which may impact their QoL (Stømer et al., 2020a).

The result showed that adherence to medication was related to all dimensions of the quality of life except the physical dimension. Health literacy is associated with medication adherence among patients with chronic kidney disease receiving hemodialysis (Barbosa et al., 2021; Fatima et al., 2022; Stømer et al., 2020). A previous study revealed that self-reported low medication adherence was associated with an increased risk for CKD progression (Cedillo-Couvert et al., 2018). Low health literacy contributes to medication non-adherence and poorer health outcomes in chronic disease patients (Fredericksen et al., 2019). The lack of patient understanding regarding medications' indications and potential side effects can cause discomfort and make them more susceptible to non-adherence. Individuals with high-level health literacy likely find it easier to understand and comprehend the benefits and risks associated with medications, as supported by a study by Coskun and Bagcivan (2020), which found that patients with low health literacy may not fully understand the benefits and risks associated with a particular medication. Patients with chronic kidney disease who were well-educated about their health also adhered to their medications more consistently. An earlier study revealed that knowledge and education substantially predicted the self-management score (Mailani et al., 2023).

Multiple regression analysis in this study revealed that of the three components of health literacy, health promotion has the most significant influence on patients' quality of life, contributing 25.1%, while the healthcare with the most significant influence on medication adherence is 43.3%. This aligns with a previous study that showed lower health literacy proportions were found in domains related to healthcare providers' support and appraisal of health information. The study highlights the need for healthcare professionals to improve communication, education, and support for patients with CKD, particularly in the early stages and during kidney replacement therapy (Dinh et al., 2021).

Chronic renal disease management calls for substantial patient input in decision-making and the execution of treatment strategies (Peng et al., 2019).

Patients need adequate knowledge and information about kidney disease management due to its complexity and impact on various aspects of life. Healthcare professionals have an essential role in assisting patients in making treatment decisions by providing education tailored to their needs to improve their health literacy (Paterick et al., 2017). The capacity to interact with healthcare professionals and actively manage health is essential for patients' quality of life and has a role in drug adherence. However, lower levels of education, income, or living in rural areas were each significantly more likely to contribute to lower health literacy levels in multiple domains, and greater comorbidity severity was significantly associated with lower health literacy in two domains. Finding information, understanding health information, and critical appraisal of health information were reported as challenging activities for participants (Dinh et al., 2021).

Chronic kidney disease patients must get ongoing care to maintain their health; various issues might affect their quality of life. Therefore, patients with good health literacy in hemodialysis find it easier to self-manage their treatment regimens, reducing symptoms and improving their quality of life (Pratiwi et al., 2020). Low health literacy poses a challenge for individuals to understand received health information, which can significantly impact their quality of life (Stømer et al., 2020b).

Based on the findings of this study, it is essential for patients with chronic kidney disease undergoing long-term therapies such as hemodialysis to possess high-level health literacy. Chronic kidney disease patients need to improve their health literacy as one of the efforts to enhance their quality of life. This group requires special attention during hemodialysis, particularly for patients with low health or low-level literacy. It is essential to build effective strategies for healthcare providers to communicate and educate patients about kidney health, including building a patient-centered approach, utilizing a teach-back method, providing written materials, incorporating visual aids, leveraging technology, and collaborating with interdisciplinary healthcare teams. Further investigation is warranted to ascertain whether poor QoL stems from overall low HL or vice versa.

This study has several limitations, including a small sample size, single-center, and cross-sectional study design. In this study, we did not analyze associated characteristic demographics and comorbidities with domain health literacy, QOL, and medication adherence. Additionally, we did not evaluate specific cognitive impairment, which has been shown to limit individuals with advanced kidney disease's capacity for self-management.

Conclusion

The research findings showed that health literacy among patients varied in the high-level, mid-level, and low-level health literacy categories. The analysis established a significant correlation between health literacy, medication adherence, and quality of life in hemodialysis patients. Therefore, it is crucial to implement initiatives aimed at enhancing health literacy among these patients. Healthcare providers can play a vital role in achieving this by offering regular education tailored to the specific information needs of individual patients. Additionally, providing informational resources, such as books or leaflets, in a language that patients can easily understand would be beneficial in improving health literacy and overall health outcomes.

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