Jurnal Keperawatan Muhammadiyah

Alamat Website: http://journal.um-surabaya.ac.id/index.php/JKM

A Common-Sense Model Perspective on Illness Perception, Adherence Behaviors, and Quality of Life in Hemodialysis Patients

Dhea Natashia [1], Rini Rismawati [1], Dian Fitria [2], Shannastaniar Aisya Adif [3]

[1] *Lecturer, Nursing Program, Fakultas Ilmu Keperawatan Universitas Muhammadiyah Jakarta, Jl. Cempaka Putih Tengah 27, Cempaka Putih, Jakarta Pusat 10510*

[2] *Lecturer, Nursing Program, Sekolah Tinggi Ilmu Kesehatan RS Husada, Jl. Mangga Besar no 137-139, Jakarta Pusat 10730.*

[3] *Lecturer, Nursing Program, Faculty of Medicine, Universitas Negeri Malang*

INFORMASI

Korespondensi:
natashia_dhea@umj.ac.id

Keywords:
Chronic Kidney Diseases Chronic; Renal Dialysis; Perception; Patient Compliance; Quality of Life

ABSTRACT

Objective: to examine the associations among illness perception, adherence behaviors, and quality of life in patients with chronic kidney disease undergoing hemodialysis from a Common-Sense Model perspective.

Methods: A cross-sectional study was conducted among adult patients with chronic kidney disease undergoing hemodialysis in two dialysis centers. Illness perception was assessed using the Brief Illness Perception Questionnaire; adherence behaviors using the End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ); and quality of life using the KDQOL-SF. Pearson correlation tests were used to analyze associations among variables.

Results: Illness perception was not significantly associated with adherence behaviors or any quality-of-life domain. In contrast, specific adherence behaviors demonstrated significant relationships with mental health outcomes. Adherence to fluid restrictions was positively associated with the Mental Component Summary (MCS) ($r = 0.302$, $p < 0.01$), and dietary adherence also correlated with MCS ($r = 0.238$, $p < 0.05$). No adherence variable was associated with the Physical Component Summary (PCS). Interdialytic Weight Gain (IDWG) showed negative correlations with PCS ($r = -0.250$, $p < 0.05$) and the burden-of-kidney-disease domain ($r = -0.278$, $p < 0.05$), indicating poorer physical well-being with higher fluid accumulation.

Conclusion: Within the CSM framework, illness perception did not predict adherence or quality of life. Adherence to dietary restrictions, adherence to fluid restrictions, and effective fluid management emerged as important correlates of both the mental and physical aspects of quality of life. Interventions that strengthen behavioral adherence and promote optimal fluid control may provide greater improvements in patient well-being compared to approaches that focus only on modifying illness perceptions.

INTRODUCTION

Chronic kidney disease (CKD) is a growing global health concern, affecting an estimated 697.3 million individuals between 1990 and 2019, with mortality increasing from 1.3% to 2.5% during the same period (Feng et al., 2023). By 2017, CKD accounted for 4.6% of all global deaths, ranking as the 12th leading cause of mortality worldwide (Bikbov et al., 2020). In Indonesia, the prevalence of CKD has also shown a rising trend, as reflected in national health surveys and population-based studies (Hustrini et al., 2022). Hemodialysis remains the most widely used renal replacement therapy, yet it does not cure the disease and requires lifelong disease management.

Patients with CKD undergoing hemodialysis face a highly complex treatment regimen that includes medication management, strict fluid and dietary restrictions, blood pressure and glucose monitoring, physical activity regulation, and avoidance of nephrotoxic substances (Arya S et al., 2025; Stengel et al., 2021). This demanding regimen affects many aspects of daily life and requires sustained adherence over the long term. Previous research indicates that nonadherence remains a significant challenge, occurring in 34% to 70% of patients (Ozen et al., 2019). Poor adherence contributes to increased complications, hospitalizations, mortality, and reduced quality of life (Naryati & Nugrahandari, 2021; Pratiwi et al., 2020).

Illness perception has emerged as an important psychological factor influencing adherence. Illness perception reflects patients' cognitive and emotional beliefs about their disease, including its consequences, controllability, and seriousness (Broadbent et al., 2015). These beliefs shape coping behaviors and influence health outcomes, including symptom experience and quality of life (Lestarina et al., 2022; Suganthi et al., 2020). Evidence suggests that clearer understanding of illness and treatment necessity can improve adherence and therapeutic effectiveness (Clarke et al., 2016).

The Common-Sense Model of Self-Regulation (CSM) offers a well-established theoretical framework for explaining how individuals make sense of illness and regulate health-related behaviors (Leventhal et al., 2016). Within this framework, illness perceptions inform coping responses, including treatment adherence, which subsequently influence psychological and health-related quality-of-life outcomes (Hagger & Orbell, 2022). Nevertheless, evidence among haemodialysis populations has yielded mixed results, suggesting that these relationships may be shaped by contextual and cultural factors. Given the paucity of empirical research from Indonesia, applying the CSM in this setting may advance understanding of how patients cognitively and emotionally represent chronic kidney disease and its treatment. Therefore, this study aims to examine the associations among illness perceptions, adherence behaviors, and quality of life among patients with chronic kidney disease undergoing hemodialysis, using the Common-Sense Model of Self-Regulation as the guiding theoretical framework.

METHOD

Design and Sampling

This study employed a descriptive correlational design to examine relationships among the study variables, guided by an established theoretical model. The study population consisted of patients with chronic kidney disease (CKD) undergoing maintenance hemodialysis. A total sampling technique was applied to ensure comprehensive representation of the accessible population.

Based on the hemodialysis unit report in April 2023, 81 patients were registered in the hemodialysis schedule, with approximately 27 hemodialysis sessions conducted per day. During the data collection period, 72 patients met the eligibility criteria and agreed to participate, and were included in the final analysis.

Participants: Inclusion and Exclusion Criteria

Participants were adult patients diagnosed with CKD who were receiving routine hemodialysis at the study site. Inclusion criteria were: aged 18 years or older, having undergone hemodialysis for at least three months, and ability to communicate in Indonesian.

Patients were excluded if they experienced acute medical instability during the data collection period, had cognitive impairments that limited their ability to provide reliable responses, or declined to participate after receiving a complete explanation of the study.

Conceptual Framework

The study was informed by the Common-Sense Model of Self-Regulation, which posits that patients form cognitive and emotional representations of their illness that guide subsequent coping responses, including adherence to treatment (Leventhal et al., 2016). These coping behaviors, in turn, influence health outcomes and overall well-being. In the context of chronic kidney disease, the model positions illness perception as the proximal determinant of adherence behaviors, which subsequently affect multiple dimensions of quality of life. This framework guided variable selection and informed the analytic approach used in the study.

Ethical Considerations

The study received ethical approval from the Research Ethics Committee of Universitas Muhammadiyah Jakarta (Approval No. **0937/F.9-UMJ/VI/2023**). All participants provided informed consent before data collection.

Instruments

Data were collected using a demographic questionnaire ,The Brief Illness Perception Questionnaire (B-IPQ) developed by (Broadbent et al., 2006) has demonstrated good psychometric properties, including acceptable test–retest reliability and concurrent validity across diverse clinical populations. Adherence behaviors were measured using the End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ) by Kim et al., (2010) which has shown strong construct validity and high internal consistency, with reported Cronbach's alpha values ranging from approximately 0.78 to 0.89 and good intraclass correlation coefficients. Quality of life was assessed using the Kidney Disease Quality of Life Instrument (KDQOL-36™), which has been validated among patients with chronic kidney disease and hemodialysis populations, demonstrating good construct and known-group validity, as well as satisfactory internal consistency (Cronbach's alpha > 0.70) across its domains(J.-Y. Kim et al., 2013) .

Data Collection Procedure

The research process commenced with obtaining ethical clearance and institutional permission from Universitas Muhammadiyah Jakarta. Following approval, the researcher sought permission from the administration of a public hospital in West Java to conduct data collection in its hemodialysis unit. Coordination was carried out with the head of the unit to arrange the schedule, and a briefing session was conducted with hemodialysis nurses to ensure a shared understanding of the study instruments and procedures.

Eligible hemodialysis patients were identified with the assistance of hemodialysis nurses. The researcher introduced the study, explained its objectives and procedures, and invited patients to participate. Those who agreed signed an informed consent form. The researcher read each questionnaire item to the respondents and provided clarification when needed. Once all questionnaires were completed, the session was concluded. The collected data were subsequently checked, coded, and prepared for statistical analysis.

Data Analysis

Data were analyzed using a quantitative correlational approach guided by the Common-Sense Model of Self-Regulation. Descriptive statistics were used to summarize participants' demographic characteristics and study variables. The distribution of continuous variables was examined using the Shapiro–Wilk normality test, which indicated a non-normal distribution. Accordingly, Spearman's rank-order correlation was applied to examine the associations among illness perception, adherence behaviors, and quality-of-life outcomes. This analytical approach enabled the assessment of bivariate relationships in accordance with the study's theoretical framework. All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS), with a two-tailed significance level set at $p < 0.05$.

RESULTS

Demographic and Clinical Characteristics

A total of 72 hemodialysis patients participated in the study. The mean age was 51.78 years (SD = 12.12), with a majority being male (55.6%), having an elementary school education (43.1%), and being unemployed (79.2%). The mean duration of hemodialysis treatment was 24.94 months (SD = 29.87). Based on the Charlson Comorbidity Index (CCI), most patients had mild comorbidities (37.5%). Detailed characteristics are presented in Table 1.

Table 1. Distribution of Hemodialysis Patient Demographic Data **(*n*=72)**

Demographic & Patient Characteristics	***Mean* ± SD**	Min –Max	f	%
Age (years)	51.78 ± 12.12	23 – 71		
Duration of Hemodialysis (months)	24.94 ± 29.87	1 – 126		
Gender				
Male			40	55.6
Female			32	44.4
Education				
Primary School			31	43.1
Junior High School			12	16.7
Senior High School			26	36.1
Higher Education			3	4.2
Employement Status				
Employed			15	20.8
Unemployed			57	79.2
Commorbidity				
Mild			27	37.5
Moderate			23	31.9
Severe			22	30.6

Overview of IDWG, Illness Perception, and Treatment Adherence

Table 2 presents the distribution of IDWG, illness perception, and treatment adherence. The mean IDWG percentage was 4.65% (SD = 4.47). The mean illness perception score was 72.99 (SD = 4.98), indicating generally negative perceptions of chronic kidney disease (higher scores reflect poorer perceptions).

The total adherence score averaged 1049.31 (SD = 178.16). The highest adherence was found in hemodialysis attendance, while the lowest adherence was observed in fluid restriction behaviors.

Table 2. Distribution of Percentage Data on IDWG, Illness Perception, and Therapy Adherence among Hemodialysis Patients ***(n=72)***

Variable	Mean	Median	SD	Min – Max
IDWG (%)	4.65	3.67	4.47	0 – 18.92
Illness Perception	72.99	74.50	4.98	54 – 80
Total Hemodialysis Adherence Score	1049.31	1075.00	178.16	450 – 1200
Hemodialysis Attendance	239.06	300.00	34.91	100 – 300
Hemodialysis Session Shortening Episodes	188.19	200.00	28.44	100 – 200
Duration of Shortened Hemodialysis Sessions	95.14	100.00	13.02	25 – 100
Medication Adherence	187.50	200.00	39.13	0 – 200
Adherence to Fluid Restriction	127.78	150.00	83.87	0 – 200
Dietary Adherence	157.64	200.00	73.47	0 – 200

Quality of Life

Quality of life was assessed using the KDQOL-36. The mean scores were as follows: Physical Component Summary (PCS) 36.80 (SD = 10.33), Mental Component Summary (MCS) 50.23 (SD = 8.13), Burden of Kidney Disease (BKD) 45.31 (SD = 30.68), Symptoms and Problems of Kidney Disease (SPKD) 76.07 (SD = 20.77), and Effects of Kidney Disease (EKD) 76.26 (SD = 22.12). The overall mean KDQOL-36 score was 58.97 (SD = 11.52). Higher scores indicate better quality of life (Table 3).

Correlations Among IDWG, Illness Perception, Adherence, and Quality of Life

IDWG in Relation to Adherence

Interdialytic weight gain (IDWG) demonstrated several notable associations with treatment adherence. Higher IDWG was linked with lower medication adherence ($r = –0.241$, $p = 0.042$), indicating that patients who accumulated more fluid between sessions were also less consistent in taking their prescribed medications. A stronger negative association was observed between IDWG and adherence to fluid restriction ($r = –0.399$, $p = 0.001$), reflecting poorer fluid-management behavior among patients with higher IDWG. No significant relationship was found between IDWG and illness perception ($r = 0.131$, $p = 0.273$).

Illness Perception in Relation to Adherence

Illness perception did not show meaningful associations with any adherence indicators. Correlation coefficients with hemodialysis attendance, medication adherence, fluid-restriction adherence, and dietary adherence were small and statistically non-significant (all $p > 0.05$). These findings suggest that patients' cognitive and emotional representations of their illness were not directly reflected in their adherence behaviors.

IDWG in Relation to Quality of Life

IDWG was significantly associated with specific quality-of-life domains. Higher IDWG was correlated with lower physical functioning, as reflected by the negative correlation with the SF-12 Physical Component Summary (PCS) score ($r = –0.250$, $p = 0.034$). A similar negative association appeared with the Burden of Kidney Disease (BKD) domain ($r = –0.278$, $p = 0.018$), indicating that patients with better fluid control experienced a lower perceived disease burden. No associations were observed between IDWG and MCS, EKD, or SPKD.

Illness Perception in Relation to Quality of Life

Illness perception showed no significant correlations with any of the quality-of-life domains. The associations with PCS ($r = –0.053$, $p = 0.655$), MCS ($r = –0.080$, $p = 0.497$), BKD ($r = –0.165$, $p = 0.169$), EKD ($r = –0.056$, $p = 0.633$), and SPKD ($r = –0.009$, $p = 0.938$) were all small and statistically nonsignificant. These findings indicate that illness perception did not exert a measurable

influence on physical functioning, mental well-being, or disease-specific quality-of-life experiences among hemodialysis patients in this study.

Adherence in Relation to Quality of Life

Adherence behaviors demonstrated selective associations with quality-of-life domains. Better adherence to fluid restriction was positively correlated with higher MCS scores (r = 0.302, p = 0.010), indicating improved mental well-being among patients who maintained fluid control. Dietary adherence also showed a positive correlation with MCS (r = 0.238, p = 0.044). No adherence variables were significantly related to PCS, consistent with the pattern observed in Table 4.

Table 3. Distribution of Quality of Life among Hemodialysis Patients (*n*=72)

Domain	Mean	Median	SD	Min – Max
Physical Component Summary	36.80	35.40	10.33	19.66 – 60.86
Mental Component Summary	50.23	51.62	8.13	32.05 – 69.39
Burden of Kidney Disease	45.31	37.50	30.68	0.00 – 100.00
Effect of Kidney Disease	76.26	84.38	22.12	25.00 – 100.00
Symptom & Problem of Kidney Disease	76.07	80.21	20.77	27.08 – 100.00
Total Score	58.97	58.25	11.52	30 – 83

Table 4. Spearman's rho Correlations Among Interdialytic Weight Gain, Illness Perception, Treatment Adherence, and Quality of Life in Hemodialysis Patients(n = 72)

Variable(s)	IDWG	Illness Perception	Hemodialysis Treatment Adherence	Medication Adherence	Adherence to Fluid Restriction	Dietary Adherence	PCS	MCS	BKD	EKD	SPKD
IDWG	-	0.131	-0.058	-0.241*	-0.399**	-0.214	-0.250*	-0.131	-0.278*	-0.093	-0.185
Illness Perception	0.131	-	0.076	0.113	0.095	0.0001	-0.053	-0.080	-0.165	-0.056	-0.009
Hemodialysis Treatment Adherence	-0.058	0.076	-	0.399**	0.238*	0.348**	0.175	0.133	-0.048	0.052	0.739
Medication Adherence	-0.241*	0.113	0.399**	-	0.368**	0.372**	0.115	0.043	-0.076	0.077	0.176
Adherence to Fluid Restriction	-0.399**	0.095	0.238*	0.368**	-	0.561**	0.109	0.302**	0.164	0.193	-0.003
Dietary Adherence	-0.214	0.0001	0.348**	0.372**	0.561**	-	0.019	0.238*	0.049	0.185	0.011
PCS	-0.250*	-0.053	0.175	0.115	0.109	0.019	-	-0.053	0.245*	0.238*	0.369**
MCS	-0.131	-0.080	0.133	0.043	0.302**	0.238*	-0.053	-	0.262*	0.005	-0.002
BKD	-0.278*	-0.165	-0.048	-0.076	0.164	0.049	0.245*	0.262*	-	0.355**	0.430**
EKD	-0.093	-0.056	0.052	0.077	0.193	0.185	0.238*	0.005	0.355**	-	0.655**
SPKD	-0.185	-0.009	0.040	0.176	-0.003	0.011	0.369**	-0.002	0.430**	0.655**	-

* $p < 0.05$

** $p < 0.01$

*SF-12 Physical Component Summary (PCS), SF-12 Mental Component Summary (MCS), Burden of kidney disease (BKD), Symptom and problem of kidney disease (SPKD), Effects of kidney disease (EKD)

DISCUSSION

The present study explored illness perception, adherence to treatment regimens, and quality of life among hemodialysis patients receiving treatment in a public hospital in West Java. The demographic characteristics of the respondents provide important context for interpreting the relationships observed. The average age of participants was 52 years, ranging from 23 to 71 years. Older age is well known as a non-modifiable risk factor for decreased kidney function, with greater susceptibility to chronic kidney disease (CKD) due to the presence of comorbidities such as hypertension, diabetes, and cardiovascular disease (Vaidya & Aeddula, 2024).

These findings are consistent with a previous study by (Delima & Tjitra, 2017), which reported that CKD cases were most prevalent among individuals aged 52 years and above.

Most respondents had undergone haemodialysis for more than 24 months, with twice-weekly sessions lasting approximately four and a half hours. Haemodialysis serves as a substitute for impaired renal function, removing excess fluid and metabolic waste through an artificial kidney (Kotanko et al., 2023)The majority of participants were male (55.6%), and qualitative responses revealed that several male patients attributed their disease to smoking or frequent consumption of caffeinated or packaged beverages. This aligns with findings by Seli and Harahap, (2021) and Tajally Adhiatma et al., (2016), who reported a higher proportion of CKD among men, partly due to lifestyle-related risk factors.

Respondents generally had low educational attainment, which may contribute to limited knowledge about kidney health and healthy lifestyle practices. Lower education levels can impede understanding of disease processes, treatment regimens, and preventive behaviors, calling attention to the need for targeted health education interventions in communities with limited exposure to health information. In addition, most respondents were unemployed (79.2%). Many reported fatigue after hemodialysis, which is recognized as a predictor of diminished quality of life across physical, psychological, social, and environmental domains (Natashia et al., 2019, 2020). Others reported unemployment due to retirement or challenges adapting work schedules to the demands of hemodialysis. These patterns are consistent with findings from Candra Anita and Novitasari, (2017) and Alshammari et al., (2024)who reported similar difficulties related to fatigue, time constraints, and employment challenges among hemodialysis patients.

Diabetes mellitus was the most common comorbidity among respondents. Diabetes contributes to diabetic nephropathy and progressive glomerular damage due to metabolic and hemodynamic alterations, leading to albuminuria and reduced renal filtration (Sara, Yohanes, et al., 2021). Such comorbidities further complicate self-management and adversely impact quality of life.

In terms of illness perception, more than half of the respondents demonstrated negative perceptions of their disease, viewing CKD as a burden that significantly disrupts their lives. Illness perception reflects patients' cognitive and emotional interpretations of their condition—how they understand the cause, timeline, consequences, controllability, and symptoms (Broadbent et al., 2015). Consistent with the findings of Pratiwi et al., (2020) many patients in this study perceived their disease as threatening, which aligns with literature indicating that negative illness perceptions are associated with psychological distress, including stress, depression, and hopelessness (Siarava et al., 2020).

Adherence to treatment regimens was relatively high, with 58% of respondents categorised as adherent. Patients commonly reported consistent attendance at hemodialysis sessions, medication intake, and fluid restriction, explaining strategies such as reducing salt in instant noodles or consciously limiting beverage consumption. This level of adherence is in line with findings by Alatawi et al., (2024)who reported that hemodialysis adherence was influenced by the desire to maintain disease stability and avoid disrupting daily activities. However, factors such as low motivation, treatment discomfort, family support, and distance to the hospital continue to affect adherence patterns (Anwar & Nunung, 2023)

IDWG emerged as a particularly important behavioral and clinical marker among patients with hemodialysis (Bossola et al., 2025). IDWG reflects fluid accumulation between dialysis sessions and is widely recognized as a sensitive indicator of adherence to fluid and dietary restrictions. Higher IDWG values in this sample were strongly associated with poorer adherence, particularly to fluid restriction, indicating that IDWG provides an objective representation of patients' daily self-management(Natashia et al., 2019). Elevated IDWG also showed significant negative associations with physical functioning (PCS) and the perceived burden of kidney disease (BKD). These findings suggest that poor fluid control may worsen physical symptoms such as edema, fatigue, and dyspnea, thereby directly reducing functional status and increasing perceived disease burden. This is consistent with existing evidence describing IDWG as a clinical predictor of hospitalization, cardiovascular strain, and diminished quality of life among hemodialysis patients (Albalushi et al., 2024). Given this evidence, IDWG serves not only as an adherence marker but also as an actionable indicator for clinical intervention. These findings reinforce the quantitative results presented in the adherence and quality-of-life tables, where higher IDWG values consistently aligned with poorer physical functioning and greater perceived disease burden.

Overall quality of life was poor in more than half of the respondents. This pattern reflects the cumulative impact of prolonged treatment duration, comorbid conditions, and behavioral demands documented in the demographic and adherence data. CKD affects physical health, emotional well-being, social interactions, and financial stability. This study's findings mirror those of who reported poor quality of life among

hemodialysis patients due to progressive disease burden and treatment stressors (Wahyuni et al., (2018). Patients with diabetes-related CKD also show worse outcomes than those without diabetes consistent with the comorbidity patterns observed in this study (Putri et al., 2017).

The correlation analysis revealed no significant associations between illness perception and any domain of quality of life. This finding is consistent with (Untari et al., 2021) who also reported that illness perception was not statistically related to quality of life among CKD patients. A similar pattern was observed in (Perwitasari et al., 2017) study of diabetic patients, where illness perception was not significantly correlated with quality-of-life measures. Within the framework of the Common-Sense Model (CSM), these results suggest that although patients may hold negative representations of their illness, these perceptions may not directly translate into behavior or quality-of-life outcomes. The CSM posits that individuals form cognitive and emotional representations of illness that influence coping strategies and subsequent outcomes (Ringer, 2021). However, in this sample, patients' negative perceptions may coexist with stable coping behaviors shaped by long-term hemodialysis routines, strong social support, or habituation to treatment demands, which may weaken the link between perception and quality-of-life outcomes. The absence of a significant association should not be interpreted as a lack of clinical relevance; rather, it may indicate adaptive coping processes in patients who have undergone long-term hemodialysis and developed stable routines despite holding negative illness perceptions.

In contrast, adherence was significantly related to the psychological (MCS) component of quality of life, with higher adherence associated with better mental well-being. This suggests that patients who successfully regulate their fluid intake and dietary habits may experience greater emotional stability and a sense of control, which positively influences mental health. This finding is supported by (Tiar, 2022) who reported that adherence is positively associated with quality-of-life outcomes in hemodialysis patients. The CSM further supports this relationship, as effective coping and behavioural adherence may enhance emotional outcomes irrespective of patients' cognitive illness representations.

Taken together, this study underscores the nuanced interplay between illness cognition, behavioral regulation, and clinical outcomes among hemodialysis patients. While illness perception alone may not predict quality of life in this population, adherence behaviors, particularly those related to fluid intake as reflected in IDWG, show meaningful associations with patient outcomes. These findings support the need for interventions that strengthen self-management, enhance behavioral coping strategies, and address modifiable factors such as fluid and dietary adherence. Furthermore, individualized education and psychosocial support may help patients reinterpret their illness experiences in ways that encourage sustained engagement with treatment.

CONCLUSION

This study underscores important patterns in illness perception, adherence, and quality of life among hemodialysis patients. Although many participants held negative views about their illness, these perceptions were not significantly linked to any quality-of-life domains. In contrast, adherence behaviors, particularly to fluid and dietary restrictions, were associated with better mental health–related quality of life. Interpreted through the Common-Sense Model, these findings suggest that while cognitive representations may shape how patients understand their condition, it is their behavioral responses that more directly influence well-being.

This study is limited by its cross-sectional design, modest sample size, and reliance on self-reported measures, which may restrict causal inference and generalizability. Future research should explore longitudinal pathways within the Common-Sense Model to better capture how illness perceptions and behaviors interact over time to shape health outcomes.

SUGGESTION

The study recommends strengthening behavioral adherence through tailored education, continuous counseling, and supportive self-management programs that address patients' emotional and practical needs. Efforts should also consider the broader demographic context, including the high prevalence of comorbidities and limited employment, which may affect patients' resources and coping strategies.

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