Explore the Mediating Effect of Health-Related Quality of Life in Patients with Maintenance Hemodialysis based on Resourcefulness

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Abstract. Objective: This study aimed to determine the determinants of depressive symptoms (DSS), sleep disorders, anxiety, and health-related quality of life (HRQOL) in maintenance hemodialysis patients. Methods: A descriptive, correlational design was used to evaluate 1330 maintenance hemodialysis patients. Participants were interviewed face-to-face to collect demographic information and disease characteristics, assess self-control schedules, and survey health status. Correlation analysis, t test, analysis of variance and regression analysis were used for analysis. Results: According to the recommended classification of DSS, 56.4% of the patients had mild (31.1%), moderate (18.9%) or severe (6.2%) depressive symptoms. The pain caused by illness was positively correlated with depression, and negatively correlated with resourcefulness (- 0.28), PQOL (-0.24) and MQOL (- 0.42). Education was negatively correlated with depression (-0.19), positively correlated with resourceiness (0.28), PQOL (0.16) and MQOL (0.28). Age was positively correlated with depression and resourceiness, and negatively correlated with PQOL (- 0.48) and MQOL (- 0.18). Highly educated participants were more likely to have better PQOL and MQOL. Lower DSS. Higher monthly household income is more likely to have better MQOL and lower DSS, and there is no correlation with PQOL. Higher education is associated with more sleep disturbances, resourcefulness, and anxiety; The higher the monthly income, the lower the anxiety and the higher the resourcefulness; Stage II patients have more sleep disorders, resourcefulness, anxiety; People with depression tend to have more sleep disturbances, resourcefulness, and anxiety. Conclusion: Nursing professionals need to spot mental illness and must be especially vigilant for those with mental retardation and sleep disorders. The impact of resourcefulness on health-related mental and physical quality of life was identified in maintenance hemodialysis patients, where resourcefulness played a beneficial role as a mediator of symptoms from pain to depression, PQOL, and MQOL, respectively. Resourcefulness has an effect on reducing depressive symptoms in maintenance hemodialysis patients.

Keywords: Resourcefulness; Maintenance Hemodialysis; Sleep Disorders; Anxiety; Depression.

1. Introduction

The global prevalence of chronic kidney disease (CKD) is 9.1% (697.5 million people), and China has 132.3 million CKD patients [1].End-stage renal disease (ESRD) is the final stage of CKD and can only be prolonged with kidney replacement therapy such as hemodialysis, peritoneal dialysis, or kidney transplant therapy.Maintenance hemodialysis (MHD) is the main treatment method in mainland China.According to the China National Renal Data System 2020, there are about 632,000 MHD patients [2].End-stage renal disease remains an incurable condition, although current treatments can extend survival.Compared with young patients, elderly patients are more likely to have complications during treatment and have shorter survival [3].One study indicated that the mortality rate of one year of dialysis was 54.5% in people over 65 years of age and 70.6% in people over 85 years of age [4]. Notably, older ESRD patients had higher rates of hospitalization, intensive care admissions, and other intensive care in the last month of life compared to patients with cancer, COPD, and heart failure [5,9].

Due to the dual effects of the disease itself and hemodialysis treatment, patients tend to have various symptoms, such as fatigue, dry skin, sleep disorders, muscle spasms, pruritus and other physical symptoms, as well as psychological symptoms such as anxiety, worry and depression, which

cause a huge burden on patients' lives [6,7].Because elderly patients are prone to multiple chronic diseases and dysfunction, they have a heavier burden of symptoms and poorer health-related quality of life (HRQOL) than younger patients [8-9].Generally speaking, HRQOL is the embodiment of quality of life (PQOL) and psychological quality of life (MQOL).

The concept of resourcefulness was proposed by Zauszniewski et al., which refers to the ability of individuals to perform daily affairs independently (personal resourcefulness) and the ability to get help from the outside world when individuals cannot perform daily affairs independently (social resourcefulness).It is an effective way of thinking that can guide behavior; It mainly includes: to obtain the maximum benefit as far as possible; Minimize operational risks.Obviously, the best strategy is to achieve the greatest benefit with almost no risk.In maintenance hemodialysis patients, the most desired is long life, but because of the long suffering and the huge cost of treatment, patients' physical and mental health has suffered to some extent.For this reason, resourcefulness plays an important role in reducing depression levels in maintenance hemodialysis patients.

HRQOL is a multi-dimensional structure, including both physiological and emotional aspects. HRQOL is related not only to coping with disease-specific physical complications, but also to the impact of treatment and decisions related to treatment that occur in patients' daily lives.Patients with maintenance hemodialysis and their treatment for specific diseases and general aspects that can affect the patient's life;However, this effect may vary depending on the stage of maintenance hemodialysis and the treatment used.HRQOL was inconsistent in patients with advanced disease.Resourcefulness is a measure of an individual's ability to cope and may require a personal computer.Resourcefulness has been studied in several areas of medicine.Recently, researchers reported that resourceful nurses showed fewer depressive symptoms, while resourceful women with breast cancer also showed more help-seeking behaviors and had better HRQOL.

Our study aims to understand the relationship between disease-related factors and different treatment strategies and their impact on health outcomes. To determine the determinants of depressive symptoms (DSS), sleep disturbances, anxiety, and health-related quality of life (HRQOL) in patients with maintenance hemodialysis.

2. Method

2.1 Study Design

A cross-sectional descriptive correlational design was used to examine the relationship between patient demographics, resourcefulness, and health outcomes in maintenance hemodialysis patients.The sample size included 1330 PC users over the age of 20.To be eligible for the study, maintenance hemodialysis patients enrolled were also required to have no other comorbid physical or psychological conditions.Upon approval by the Institutional Review Board (IRB), potential participants who met the inclusion criteria were provided with complete information about the study and were free to participate or withdraw at any time.After receiving written informed consent from the participants, investigators conducted individual face-to-face structured interviews to collect data.

2.2 Research Tools

Collect the following data: demographic information; Disease characteristics; Self-care schedule measures Resourcefulness, the Center for Epidemiological Research Depression Scale and the Brief Form of the Medical Outcomes Survey.

2.2.1 CES-D Measurement of Depressive Symptoms

Depressive symptoms were measured using CES-D.CES-D is a list of 20 items with four Likert scales (0 = little or no time to 3 = most or all time) used to assess how often a person experienced certain symptoms or feelings in the previous week.The total score is the sum of ordered responses to 20 items, with higher scores indicating more severe depression.A score of 16 or above is considered a risk for clinical depression.For the classification of depression level, a score below 16 indicates

stable emotional status and no depression;A score of 16 to 20 indicates a mild depressive state;A score of 21 to 26 indicates moderate depressive symptoms;A score of 27 to 60 indicates a mood state that has reached severe depressive symptoms.The α value in the study is 0.96[9].

2.2.2 Self-control Scale (SCS) Measures the Degree of Resourcefulness

The 36-item Self-control Scale (SCS) reported by Rosenbaum was used to measure resourcefulness.These programs are based on individuals' reports of the extent to which they are being evaluated on behalf of their own behavior.SCS uses a Likert-style rating scale ranging from -3(very un-me) to + 3(very me);The score ranges from -108 to + 108.SCS was translated into Chinese and the reliability of SCS in the Taiwan sample was reported to be 0.88.Eleven items were reversed, with possible ratings ranging from -108 to + 108.According to the report, the reliability and validity of SCS have been well confirmed.In this study, the Kronbach α value was 0.96[9].

2.2.3 SF-36 Measurement of HRQOL

The SF-36 questionnaire is designed to be a general indicator of health.The SF-36 measures HRQOL and includes eight subscales related to an individual's general health, including physical functioning, role limitations, physical pain, social functioning, general mental health, role limitations, vitality, energy or fatigue, and general health perceptions.HRQOL is usually divided into two components, PQOL and MQOL, which are adopted in this stu-dy.In these subscales, the value of Kronbach α is between 0.71 and 0.96.

2.2.4 Sleep Quality Index (PQSI)

Sleep disorders were measured by the Pittsburgh Sleep Quality Index (PQSI), which consists of 19 items in 7 sections that assess an individual's sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disorders, sleep medication use, and daytime dysfunction.The sum is sleep quality scores ranging from 0 to 21 to produce a global PSQI score, with higher scores indicating poorer sleep quality.A PSQI score of > 5 indicates an individual with a sleep disorder. In this study alpha was 0.96.

2.2.5 Anxiety Scale

Anxiety is assessed by the State-Trait Anxiety Scale, which consists of 20 items and is used to assess an individual's general feelings.This scale is reported to be valid and reliable.The anxiety scale is a self-reported questionnaire on a Likert scale ranging from 1 to 4(1 = none at all, 4 = often).A score below 20 indicates no anxiety, while a score of 80 indicates the highest level of anxiety.For the classification of anxiety level, 20-39 points indicates that the emotional state has reached mild anxiety;A score of 40-59 indicates moderate anxiety;A score of 60 to 80 indicates severe anxiety.In this study, a was 0.96.

2.3 Data Analysis

The structural equation model (SEM) was derived from the review Huang and guided the analysis to examine the causal effects of sleep disturbances and LR on anxiety and depression (Figure 1).Scanning electron microscopy was also used to analyse the data.For integration at different scales, all quantity values are converted to percentages.Confirmatory factor analysis was performed to determine the construction of risk factors and the impact of LR on health outcomes.Structural regression models were used to examine the relationship between risk factors, mediators and health outcomes.The goodness of fit was evaluated by the P-value of the model CMIN (minimum difference function), the goodness of Fit index (GFI), the mean GFI (AGFI), and the approximate squared mean error (RMSEA).Throughout the study, the X2/df ratio (< 3) was used to consider the path model:Both GFI and AGFI are greater than 0.90, and the approximate square mean error (RMSEA) is less than 0.08.Preliminary data analysis included sample description using categorical variables and descriptive statistics frequency distributions.Pearson's correlation was used to assess the extent and strength of the relationship between study variables.Hierarchical regression was used to answer the research questions.In addition, ANOVA was used to determine whether there were significant

differences between individuals and maintenance hemodialysis patients regarding levels of decision support, PQOL, and MQOL.SPSS version 19.0 was used for the above analysis.P < 0.05 indicates statistical significance.

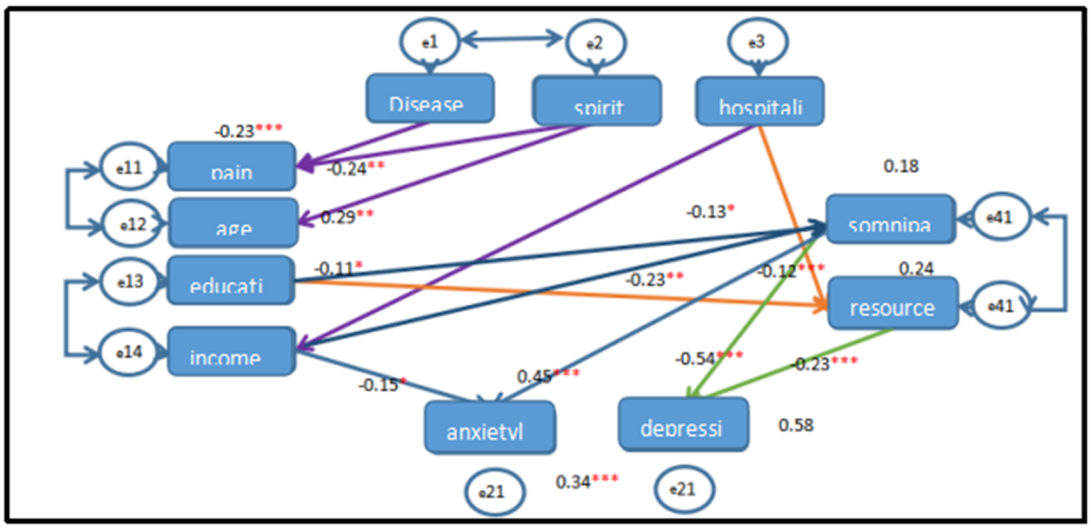


Figure 1. Sem analysis of predictors of structural health status

3. Results

3.1 Sample Characteristics

The study subjects were 1330 adult patients with maintenance hemodialysis, whose average age was 54.1± 5.4 years old and pain was 2.1±1.3 years old. Basic characteristics of the samples were shown in Table 1.

Table 1. Basic characteristics of samples

variable	Mean ± standard deviation	N
Age	54.1± 5.4	
Pain (1-10)	2.1±1.3	
Marital status		
single		5
Married/cohabiting		1241
Death of a spouse		26
Divorce (other)		58
education		
illiteracy		145
Primary school		456
Junior high school		367
High school		189
College degree or above		173
Monthly household income		
<3000		423

3000-5000		368
5000-10000		257
>10000		282
Stage of disease		
I		145
II		342
III		489
IV		356
Mental disorders		1168
No mental disorder		162
Symptoms of depression		
≥ 16		759
< 16		571

3.2 Analysis of Depressive Symptoms

Depressive symptoms were measured using CES-D and the mean score was 16.9±2.9.The total score was: normal, 0-15; Mild depression, 16-20; Moderate depression, 21-26; Major depression, 27-60.In the study, the score ranged from 3 to 33.56.4% of patients scored more than 16 points.According to the DSS recommended classification, 56.4% of patients had mild (31.1%), moderate (18.9%), or severe (6.2%) depressive symptoms.

3.3 Correlation Analysis among Variables

Table 2. Correlation between variables

variable	age	education	income	pain	Duration of illness	Stage of disease	DSS	The intelligent	PQOL	MQOL
age										
education	-0.31*									
income	- 0.16	0.16								
pain	0.07	- 0.14	- 0.05							
Duration of illness	0.09	0.09	- 0.21*	- 0.22						
Stage of disease	0.09	- 0.29*	0.32**	0.32*	- 0.23*					
DSS	0.01	-0.19*	0.22**	0.22*	- 0.11	0.27*				
The intelligent	0.13	0.28**	0.12*	- 0.28*	0.11	- 0.27*	-0.52*			
PQOL	- 0.48**	0.16**	0.01	-0.24*	0.11	- 0.26**	-0.47*	0.41**		
MQOL	- 0.18	0.28**	0.23**	- 0.42*	0.32*	- 0.45	-0.27*	0.53**	0.65**	

Note: * represent $p < 0.05$. * * represent $p < 0.01$.

The results in Table 2 show that the pain caused by the disease is positively correlated with depression, and negatively correlated with resourcefulness (- 0.28), PQOL (-0.24) and MQOL (- 0.42).Education was negatively correlated with depression (-0.19) and positively correlated with intelligence (0.28), PQOL (0.16) and MQOL (0.28).Age was positively correlated with depression and resourcefulness, but negatively correlated with PQOL (- 0.48) and MQOL (- 0.18).The duration of illness was negatively correlated with depression (- 0.11), and positively correlated with resourcefulness (0.11), PQOL (0.11) and MQOL (0.32).The disease stage was positively correlated with depression, and negatively correlated with intelligence (- 0.27), PQOL (- 0.26) and MQOL (- 0.45).Depression was negatively correlated with resourcefulness (-0.52), PQOL (-0.47) and MQOL (-0.27).Resourcefulness was positively correlated with PQOL (0.41) and MQOL (0.53).PQOL is positively correlated with MQOL.

Table 3. Differences among characteristics, PQOL, MQOL and DSS

variable	PQOL		MQOL		DSS	
	Mean ± standard deviation	p	Mean ± standard deviation	p	Mean ± standard deviation	p
education						
<Grade 6	52.9±1.3	p=0.001	47.5±3.6	p=0.002	19.8±4.3	p=0.021
>Grade 6	57.6±2.3		51.2±4.5		15.1±2.4	
Monthly household income						
<3000	53.8±2.3	p = 0.55	51.6±4.4	p<0.001	15.3±1.2	p= 0.142
>3000	54.18±4.2		45.2±2.5		16.8±4.6	
Stage of disease						
I	52.1±11.0	p < 0.01	50.5 ± 2.2	p=0.005	15.7 ± 6.9	p= 0.100
II	57.9±9.0		50.9 ± 5.1		16.2 ± 5.4	
III	54.0±8.4		50.6 ± 5.1		16.7 ± 5.6	
IV	48.1±11.1		47.4 ± 7.9		17.4 ± 4.3	
Mental disorders	52.5±4.3	p < 0.01	49.3±6.3	p < 0.01	18.2±4.5	p < 0.01
No mental disorder	64.4±5.2		50.8±4.9		8.1 ± 8.6	
Symptoms of depression						
≥ 16	47.4±4.9	p=0.001	47.4±2.0	p=0.001		
< 16	51.9±7.1		51.9±7.2			

3.4 Analysis of Differences among Demographic Characteristics, DSS, PQOL and MQOL

As Table 3 shows, highly educated participants are more likely to have better PQOL and MQOL.Lower DSS.Higher monthly household income is more likely to have better MQOL and lower DSS, and there is no correlation with PQOL.The difference of disease stage, PQOL and MQOL score was statistically significant.Stage IV has worse PQOL and MQOL; Phase II has better PQOL and MQOL.There was no statistical significance between the disease stage and depression.Mental

disorders were more likely to suffer from depression ($p < 0.01$). The degree of depressive symptoms was directly correlated with PQOL and MQOL, and the more severe the symptoms, the lower the quality of life.

3.5 Difference Analysis of Sleep Disorders, Resourcefulness, Anxiety and Mood Disorders

The incidence of sleep disorders, anxiety, DSS, and LR differences among the demographic variables of the participants are listed in Table 4.There was no statistical significance between monthly household income and sleep disorder, and the rest were correlated.Higher education is associated with more sleep disorders, intelligence, anxiety;The higher the monthly income, the lower the anxiety and the higher the resourcefulness;Stage II patients have more sleep disorders, intelligence, anxiety;People with depression about severely have more sleep disturbances, resourcefulness, and anxiety.

Table 4. Differences in sleep disorders, intelligence, anxiety and mood disorders

variable	Sleep disorder		anxiety		intelligence (LR)	
	Mean ± standard deviation	p	Mean ± standard deviation	p	Mean ± standard deviation	p
education						
<Grade 6	51.9±2.3	p=0.001	48.2±2.6	p=0.012	47.2±1.6	p=0.001
>Grade 6	58.6±2.6		53.6±4.6		52.6±4.4	
Monthly household income						
<3000	55.9±6.1	p = 0.85	52.6±2.4	p<0.001	51.6±2.8	p<0.001
>3000	58.1±2.7		45.1±2.4		54.1±3.4	
Stage of disease						
I	53.1±11.7	p < 0.01	50.7 ± 9.2	p=0.002	50.8 ± 4.2	p<0.001
II	58.9±4.0		51.9 ± 5.1		51.8 ± 2.1	
III	54.4±6.4		51.6 ± 6.1		51.1 ± 6.4	
IV	47.1±12.1		47.2 ± 8.9		44.2 ± 4.9	
Mental disorders	51.5±1.3	p < 0.01	48.3±4.3	p < 0.01	49.3±2.3	p=0.002
No mental disorder	67.4±5.8		55.8±4.7		54.8±4.2	
Symptoms of depression						
≥ 16	52.9±5.1	p=0.001	58.9±5.2	p=0.001	57.9±4.2	p<0.001
< 16	45.4±3.9		48.4±2.7		47.1±2.8	

3.6 Mediating Effect

Resourcefulness showed mediating effects on DSS and PQOL (FIG. 2 and 3, respectively).In other words, when participants were more resourceful, they showed better PQOL and MQOL and fewer depressive symptoms.In the first step of analysis, pain significantly affected DSS ($p < 0.05$).In the second step of analysis, pain significantly affected resourcefulness ($p < 0.05$), and resourcefulness strongly affected DSS ($p < 0.05$).However, in step 3 of the analysis, when resourcefulness entered regression, the effect of pain on DSS decreased and became insignificant.Full mediation is considered to have occurred if resourcefulness has a strong influence on the decision support person and the impact of suffering on the decision support person is reduced to such an extent that it becomes unimportant.That is, lower pain is associated with higher levels of resourcefulness, and higher pain is associated with greater decision support.As a person becomes more resourceful, the relationship between pain and decision support may decrease or even be unimportant.Ingenuity mediates the relationship between pain and PQOL.In the first step of analysis, pain significantly affected PQOL ($p < 0.05$).In the second step of analysis, pain significantly affected resourcefulness ($p < 0.05$), and resourcefulness strongly affected PQOL ($p < 0.05$).However, in step 3 of the analysis, when resourcefulness entered regression, the effect of pain on PQOL decreased and became non-significant.If resourcefulness strongly affects PQOL, and the effect of pain on PQOL is reduced to an insignificant degree, complete mediation is considered to have occurred.These results suggest that improving PQOL depends on individual resourcefulness.That is, lower pain was associated with

higher levels of resourcefulness and higher PQOL.As one has greater resourcefulness, the relationship between pain and PQOL may decrease or become unimportant.

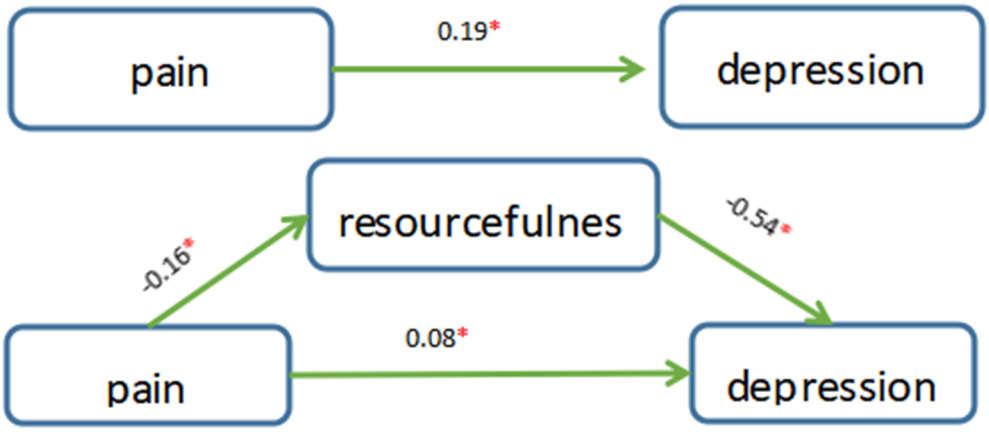


Figure 2. Mediating effects of resourcefulness on pain and depression

Note: ∗ represent $p < 0.05$. ∗ ∗ represent $p < 0.01$.

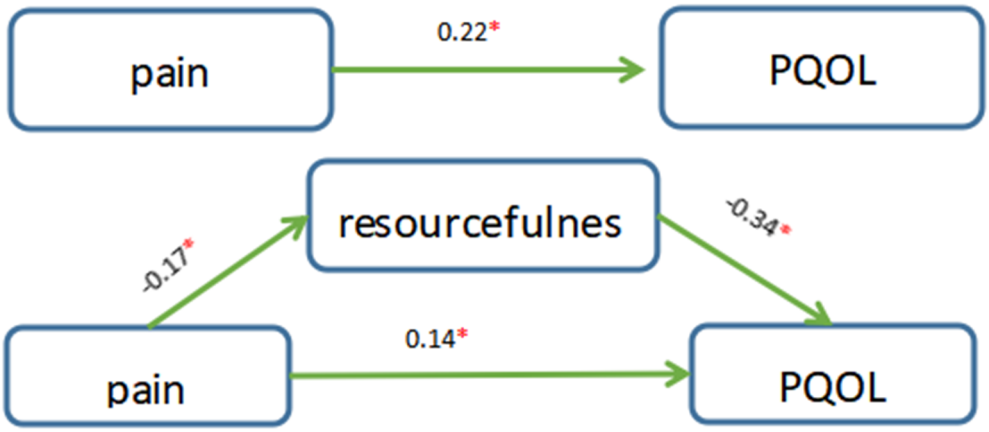


Figure 3. Mediating effects of resourcefulness, pain and MQOL

Note: ∗ represent $p < 0.05$. ∗ ∗ represent $p < 0.01$.

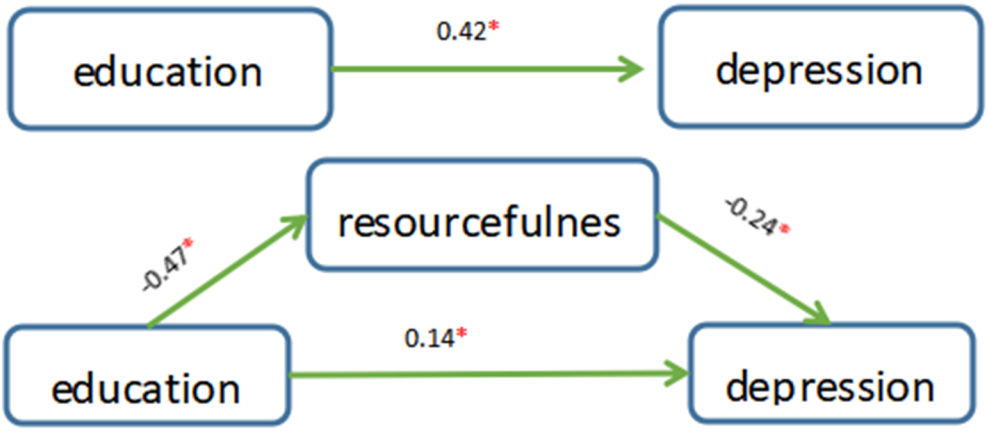


Figure 4. Mediating effects of intelligence, education and depression

Note: ∗ represent $p < 0.05$. ∗ ∗ represent $p < 0.01$.

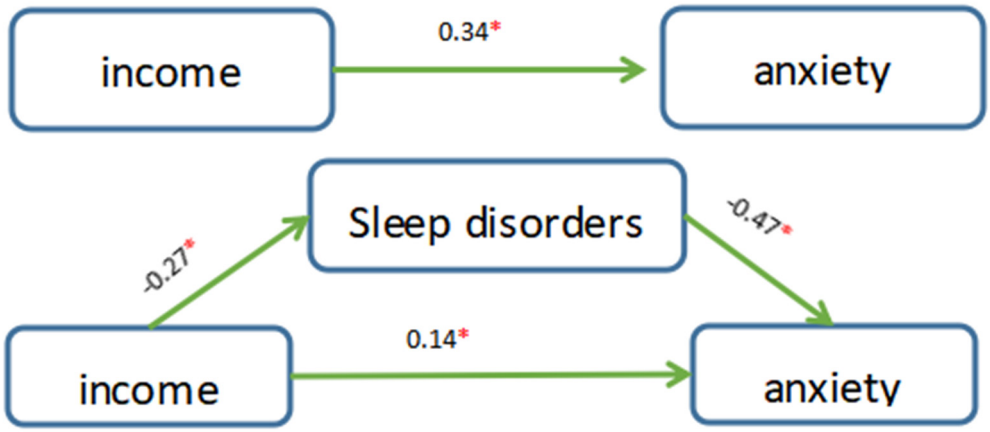


Figure 5. Mediating effects of sleep disturbance on income and anxiety

Note: ∗ represent $p < 0.05$. ∗ ∗ represent $p < 0.01$.

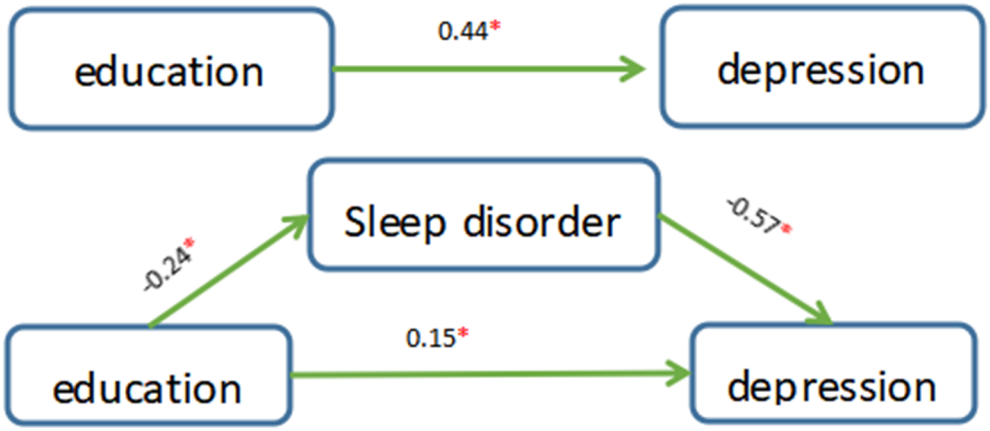


Figure 6. Mediating effects of sleep disturbance on education and anxiety

Note: ∗ represent $p < 0.05$. ∗ ∗ represent $p < 0.01$.

The first mediating effect occurs between education and resourcefulness.That is, the participants' education significantly influenced their depressive symptoms, while the wisdom they learned strongly influenced depressive symptoms.However, the importance of the relationship between education and depressive symptoms decreased when learning resourcefulness mediated the relationship (Figure 4);The second mediating effect of sleep disorders is between income and anxiety.That is, participants' income significantly affected their anxiety, and sleep disturbances strongly affected anxiety.However, when sleep disorders mediate this relationship, the importance of the relationship between income and anxiety decreases (Figure 5);A third mediated effect of sleep disorders occurs between education and DSS.That is, the participants' education significantly influenced their DSS, and sleep disorders strongly influenced DSS.However, when sleep disorders mediate this relationship, the importance of the relationship between education and DSS decreases (Figure 6).In light of the two mediating effects of sleep disorders, health care providers must consider how to reduce sleep disorders and thus be more likely to reduce anxiety and depression.

4. Discussion

Nurses' perspectives to identify risk factors for depression in survivors have been investigated in recent years.However, in Taiwan and Asia, depression in men has not been well studied.Therefore,

empirical data must be generated to encourage healthcare providers and family members to evaluate the mediating effects of health-related quality of life in patients with maintenance hemodialysis.We believe that most patients at risk for DDS have advanced disease, are distressed by the side effects of treatment, fear of relapse, may have a history of clinical depression or lack of resourcefulness [10,11].Moreover, in the current study, most participants were not highly educated, some completed primary school and others were illiterate, which had a lot to do with the presence of direct system support staff.

Most respondents have a monthly income of more than 3000, and those with high income are more intelligent and have better life quality than those with low income [12,13].In addition, the age of participants was negatively correlated with PQOL, which was consistent with previous studies [14,15].Therefore, healthcare providers may opt for interventional treatment or therapy to minimize concerns about future side effects or to find more effective ways to reduce patients' suffering [16,17].

In addition, the majority of participants in the current study had a low level of education (i.e. no education beyond primary school or illiteracy), which must be taken into account when applying interventions. For example, healthcare professionals should provide education on various treatments using easy-to-learn content that describes how certain treatments for PCS may improve patients with maintenance hemodialysis and affect PQOL, MQOL, and depression.

Healthcare professionals should assess an individual's skills according to their condition and recommend appropriate intervention strategies. If PC survivors lack resourcefulness, they are more likely to have negative health-related outcomes. In order to help maintenance hemodialysis patients have a positive attitude towards their health status or treatment process, nurses should provide psychosocial education [18,19].Because maintenance hemodialysis patients may experience side effects of invasive treatment, positive thinking and/or effective control skills can improve their ability to cope during the long course of treatment.

Individuals with higher LR are more likely to have fewer sleep disorders, anxiety, and DSS. Future studies may use experimental designs, applying appropriate psychoeducational interventions or cognitive behavioral therapy, to investigate the effects on mental or physical health.

With regard to the mediating effect identified in this study, health care professionals could offer psychoeducational instructional programs to improve resourcefulness. To promote relaxation and achieve better sleep quality can also improve health outcome variables.

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References

[1] GBD Chronic Kidney Disease Collaboration Global, regional, and national burden of chronic kidney disease, 1990-2017: A systematic analysis for the Global Burden of Disease Study 2017 Lancet, 395 (10225) (2020), pp. 709-733, 10.1016/S0140-6736(20)30045-3.

[2] Intradialytic Hypotension Prevention and Treatment Expert Working Group Renal and blood purification committee, Chinese medicine education society. Expert consensus on the prevention and treatment of intradialytic hypotension (2022) 03 Chin J Intern Med, 61 (2022), pp. 269-281, 10.3760/cma.j.cn112138-20210601-00384.

[3] Y.H. Song, G.Y. Cai, Y.F. Xiao, X.M. Chen Risk factors for mortality in elderly haemodialysis patients: a systematic review and meta-analysis BMC Nephrol, 21 (1) (2020), p. 377, 10.1186/s12882-020-02026-x.

[4] M.W. Wachterman, A.M. O'Hare, O.K. Rahman, K.A. Lorenz, E.R. Marcantonio, G.K. Alicante, et al. One-year mortality after Dialysis initiation among older adults JAMA Intern Med, 179 (7) (2019), pp. 987-990, 10.1001/jamainternmed.2019.0125.

[5] S.P.Y. Wong, W. Kreuter, A.M. O'Hare Treatment intensity at the end of life in older adults receiving long-term dialysis Arch Intern Med, 172 (8) (2012), pp. 661-663, 10.1001/archinternmed.2012.268 discussion663-4.

[6] Y.Y. Song, L. Chen, W.W. Yu, W.X. Wang, D.J. Yang, X.L. Jiang Correlates of symptom burden of hemodialysis patients West J Nurs Res, 43 (5) (2021), pp. 459-467, 10.1177/0193945920957229.

[7] A.S. You, S.S. Kalantar, K.C. Norris, R.A. Peralta, Y. Narasaki, R. Fischman, et al. Dialysis symptom index burden and symptom clusters in a prospective cohort of Dialysis patients J Nephrol, 35 (5) (2022), pp. 1427-1436, 10.1007/s40620-022-01313-0.

[8] C. McKeaveney, M. Witham, A.O. Alamrani, A.P. Maxwell, R. Mullan, H. Noble, et al. Quality of life in advanced renal disease managed either by haemodialysis or conservative care in older patients BMJ Support Palliat Care (2020), 10.1136/bmjspcare-2020-002237 2020Sep11; bmjspcare-2020-002237.

[9] Xuefei Wang, Qiuyin Shi, Yongzhen Mo, Jing Liu, Yingying Yuan, Palliative care needs and symptom burden in younger and older patients with end-stage renal disease undergoing maintenance hemodialysis: A cross-sectional study, International Journal of Nursing Sciences,2022, ISSN 2352-0132.

[10] El-Jawahri A, Traeger L, Park E R, et al. Associations among prognostic understanding, quality of life, and mood in patients with advanced cancer[J]. Cancer, 2014, 120(2): 278-285.

[11] Kim S Y, Kim J M, Kim S W, et al. Does awareness of terminal status influence survival and quality of life in terminally ill cancer patients?[J]. Psycho-Oncology, 2013, 22(10): 2206-2213.

[12] Ozdemir S, Ng S, Wong W H M, et al. Advanced Cancer Patients' Prognostic Awareness and Its Association with Anxiety, Depression and Spiritual Well-Being: A Multi-Country Study in Asia[J]. Clinical Oncology, 2022, 34(6): 368-375.

[13] Hu B, Chou Y C. Care poverty among older adults in East Asia: a comparison of unmet care needs between China and Taiwan[J]. Archives of Gerontology and Geriatrics, 2022: 104738.

[14] Scherrer G, Okuno M F P, Oliveira L M, et al. Quality of life of institutionalized aged with and without symptoms of depression[J]. Revista Brasileira de Enfermagem, 2019, 72: 127-133.

[15] Canuto A, Weber K, Baertschi M, et al. anxiety disorders in old age: psychiatric comorbidities, quality of life, and prevalence according to age, gender, and country[J]. The American Journal of Geriatric Psychiatry, 2018, 26(2): 174-185.

[16] Zhai H, Li L, Yin Y, et al. The efficacy of hemodialysis in interventional therapy in coronary artery disease patients with chronic renal insufficiency[J]. Renal Failure, 2016, 38(3): 437-441.

[17] Murphy G J, White S A, Nicholson M L. Vascular access for haemodialysis[J]. British journal of surgery, 2000, 87(10): 1300-1315.

[18] Gómez-Salgado J, Navarro-Abal Y, López-López M J, et al. Engagement, passion and meaning of work as modulating variables in nursing: A theoretical analysis[J]. International journal of environmental research and public health, 2019, 16(1): 108.

[19] Hämel K, Röhnsch G, Heumann M, et al. How do nurses support chronically ill clients' participation and self-management in primary care? A cross-country qualitative study [J]. BMC Primary Care, 2022, 23(1): 1-12.