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ORIGINAL RESEARCH

Effects of Illness Perception and Coping Style on Self-Management in Peritoneal Dialysis Patients: A Cross-Sectional Study

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Aim: Chronic disease self-management is critical to disease prognosis and patient quality of life. Several psychological factors influence this process of self-management. In this background, the present study investigated the impact of illness perceptions and coping style on self-management in people with peritoneal dialysis (PD).

Methods: The study is a cross-sectional study. From May 2022 to January 2023, a convenience sampling method was used to recruit 246 peritoneal dialysis patients. General information questionnaire, brief illness perception questionnaire, medical coping style modes questionnaire and the self-management scale for peritoneal dialysis patients were used in this study. We used SPSS 24.0 to analyze the data, and the statistical methods included descriptive analysis, single factor analysis, Pearson correlation analysis and multiple linear regression analysis.

Results: A total of 246 patients were included in this study (93.89% response rate). Cognitive representations and emotional representations were 30.40, 14.18, respectively. However, illness comprehensibility was 2.87. Illness perceptions were negative significantly correlated with self-management. With regard to coping style, our patients were more likely to adopt avoidance and resignation coping style. Confrontation and avoidance were positively related to self-management, while acceptance-resignation was negatively related.

Conclusion: Self-management of peritoneal dialysis patients needs to be improved. Age, female sex, monthly income, illness perceptions and coping style were independently associated with self-management.

Impact: These findings suggest that interventions that improve illness perceptions and coping style should be explored to ultimately improve their self-management. For example, patients can be provided with psychological counseling so that they can face the disease correctly, and we should pay attention to the positive role of social support.

Keywords: peritoneal dialysis, illness perception, coping style, self-management

Background

Due to the ageing population and an increasing prevalence of chronic disease, such as diabetes mellitus and hypertension, the incidence of chronic kidney disease (CKD) is increasing, it has been a public health challenge worldwide.[1] A global epidemiological survey reported that the prevalence of CKD was about 8–16%.[2] US Renal Data System (USRDS) revealed that the CKD prevalence increased from 13.8% in 2016 to 14.5% in 2017.[3] CKD is characterized by insidious onset and atypical early symptoms, if not detected and treated early, it will progress to end-stage renal disease (ESRD), which has become the eighth leading cause of death worldwide.[2] The patients with ESRD rely on kidney transplantation, hemodialysis or peritoneal dialysis (PD). Due to continuing improvements in clinical and better socioeconomic benefits of PD, this therapy was increasingly used worldwide and several countries have adopted policies favoring the use of this modality as the initial renal replacement therapy.[4–6] It was estimated that more than 272000 patients receive peritoneal

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dialysis worldwide, representing about 11% of the global dialysis population.[7] Global annual growth rate of peritoneal dialysis is estimated at 8%, higher than that of hemodialysis (about 6–7%).[8] In China, the utilization of PD rose steeply in the past decade, according to the Chinese National Renal Data System, the number of patients on PD rose from 37942 in 2012 to 86264 in 2018.[9] China ranks first in the world in terms of the number of patients on PD now.[10]

World Health Organization (WHO) had stated that improving the self-management of people with chronic diseases is more likely to improve their health than any other interventions.[11] Self-management improves health outcomes in chronic conditions not only by improving adherence to treatment plans but also by developing personal skills to manage challenges and solve problems. It involves a set of behaviors that people adopt as part of living with chronic illness.[12] As a method of treatment for ESRD, PD is a home-based therapy, the patients are the primary provider of disease treatment, in addition to exchange dialysate 3–5 times a day, they are required to limit water, sodium and dietary intake, taking medications, monitoring blood pressure and weight regularly to balance the body fluid, quitting smoking and exercising regularly. PD treatment involves a series of lifestyle changes, the patients need to master the skills or knowledges needed for treatment (eg, maintaining dialysis environment clean, aseptic operation, recording ultrafiltration volume, observing fluid properties, external port changes, and preventing, identifying, and managing PD-related complications). Because of this, patients with PD are likely to use self-care or lifestyle interventions as part of their self-management strategy to manage some of their symptoms.[13] Patients with PD on self-management/or self-care vary between regions. In China, Liu et al[14] concluded that self-management behaviors of patients with PD were generally moderate, with good management behaviors for medication compliance and fluid exchange operations, moderate monitoring of disease status, and the poorest nutritional intake, water and salt control. Lameire demonstrated that approximately 25% of patients with PD are volume overloaded.[15] Evidence from previous studies had supported that self-management improves health-related quality of life, improves health status and clinical outcomes.[16–18] Therefore, self-management is extremely important for patients with PD.

How patients perceived illness may affect their self-management, Self-regulation theory (SRT) provides a framework to explain the individual's adaptation to the illness, which is the Common-Sense Model (CSM).[19] It is a dynamic framework for understanding illness self-management. And it can provide advice on the progress of research and has the potential to further advance the practice of medicine and to guide patients in the self-management of their disease.[19] According to the CSM,[20] when a person is confronted with an illness or health condition, they try to make sense of it through their cognitive and emotional representations of the illness (illness perception). The CSM proposes that people will develop coping style procedures and then evaluate its success. This evaluation may result in changes in coping style strategies and/or changes in illness perceptions. The CSM includes two key components, which is cognitive representation and emotional representation, and is structured around the following nine dimensions: identity; timeline acute/chronic; timeline cyclical; consequences; personal control; treatment control; illness coherence; emotional representation and cause.[21,22] The CSM consists of two parallel processes involving cognitive and emotional representations that interact to determine a person's coping style strategies and health-related outcomes. This suggests that strong negative emotional representations may impair the impact of cognitive representations on self-management, or vice versa. Several studies have shown that illness perception is associated with psychological and clinical outcomes in a variety of populations including health behaviors,[23] psychological stress,[24,25] and quality of life.[26] It is an important predictor of patients' ability to cope and develop interventions to promote self-management in patients with chronic diseases.[27,28] Therefore, exploring the relationship between illness perception and self-management is essential to develop strategies to improve the health outcomes of patients with PD.

Coping style is a way in which an individual can maintain a stable psychological state by adjusting cognitive content and engaging in certain behaviors to cope with a stressful situation when it arises.[29] It is present throughout the process of disease onset, progression, treatment and recovery and act as important mediators of psychological distress, directly affecting the distress and influencing its outcome, which can ultimately affect the overall health of the patient. Several studies have shown that coping style can influence patient self-management.[30,31] Indeed, the presence of a chronic illness might strongly affect one's illness perception and coping style. And studies have also shown that illness perception can influence patients' quality of life and disease prognosis by stimulating them to adopt an appropriate coping style

strategy.[32,33] However, few studies have investigated the impact of illness perceptions and coping style strategies on self-management in people with PD.

Aim

The aims of the study were to examine the impact of illness perceptions and coping style on the self-management of people with PD and to identify the factors that are associated with self-management.

Methods

Reporting Method

The study adhered to "STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies".

Study Design and Sample

A cross-sectional design was used for convenience sampling. Participants were recruited from peritoneal dialysis patients who were hospitalized in the nephrology wards of two tertiary hospitals in Wuhan from May 2022 to January 2023. Eligible patients met the following inclusion criteria: (i) participations were willing and able to give informed consent for study, (ii) were male or female aged 18 years or above, and had received PD for more than 3 months, (iii) and were able to complete the questionnaire independently or with the help of the investigator. Participants with serious complications, such as malignancy and serious infection, and those receiving both hemodialysis and peritoneal dialysis will be excluded.

Data and Procedure

Approval was obtained from the Ethics Committee of the University of Wuhan and the Research Hospital prior to the start of the study (ID: 2022088K). The investigator explains the purpose of the study to patient, those who agreed to participate in this study will be recruited and provided informed consent. According to the Hoogland,[34] an appropriate minimum sample size would be 200 cases with a good model and multivariate normal data. In total, 246 of the 262 eligible participants (response rate = 93.89%) gave their consent and completed the study.

Measures

General Information Questionnaire, designed by the researcher based on a literature review, which contains patient demographics such as gender, age, marital status, education level, monthly income, employment, social insurance, as well as clinic characteristics such as primary disease, dialysis duration, operator and complications.

Illness Perception

Based on Leventhal's Common-Sense Model,[20] The Brief Illness Perception Questionnaire (BIPQ) was developed by Broadbent et al in 2006.[35] It contains eight scored items and one open-ended item, of which items 1–5 assess cognitive representations, items 6 and 8 assess emotional representations, item 7 assesses illness comprehensibility and item 9 is an assessment of casual representations, which was not included in this study because it was an open-ended question to which the patient was free to respond. Items 3, 4 and 7 are reverse scored, with each item scored cumulatively. Higher scores indicate a higher impact on the illness. Since its publication, BIPQ has been translated into several languages, including Chinese. The scale has good reliability and validity. It is widely used in chronic disease[36] and cancer research.[37,38] In the present study, the Cronbach's α coefficients of the scale was 0.728.

Coping Style

The medical coping modes questionnaire (MCMQ) was developed by Feifel.[29] It was used to assess coping style of patients. In 2000, Shen et al[39] translated it into Chinese. The revised scale contains a total of 20 entries divided into 3 dimensions: confrontation (1, 2, 5, 10, 12, 15, 16, 19), avoidance (3, 7, 8, 9, 11, 14, 17), and acceptance–resignation (4, 6, 13, 18, 20). Each item is scored on a scale of 1–4, items 1, 4, 9, 10, 12, 13, 18 and 19 were being scored reverse. Three subscales are scored separately, with higher scores indicating more use of the coping style. The Cronbach's α coefficients

were 0.69, 0.60 and 0.76, respectively. It is currently being used in the patients with PD with a Cronbach's α coefficient of 0.75.[40] The Cronbach's α coefficients for the three subscales of confrontation, avoidance and acceptance–resignation in this study were 0.734, 0.608 and 0.849 respectively.

Self-Management

The self-management scale for continuous ambulatory peritoneal dialysis patients was developed by Pang in 2014, based on the Orem's theory of self-care.[41] The scale contains 28 items and was divided into 5 subscales, including fluid exchange technique (7 items), management of abnormalities during operation (4 items), dietary management (5 items), monitoring of complications (8 items), and emotional management and social regression (4 items). All items were rated on a 4-point Likert scale, with "never", "occasionally", "often" and "always " on a scale of 0–3 respectively, with a total score of 84, the higher the score, the better the patient's self-management ability. The scale has good reliability and validity and the Cronbach's α coefficient was 0.926. The Cronbach's α coefficient for the scale in this study was 0.893.

Statistical Analyses

Data were analyzed using IBM SPSS Version 24.0, the level of statistical significance was set at $p< 0.05$. Descriptive statistics were used to describe the demographic and clinical characteristics of patients with PD. Categorical variables were described as percentage. Continuous variables including illness perception, coping style and self-management were described using mean and standard deviation. One-way ANOVA and *t*-tests were used to examine differences in general information between patients with PD, and we used Pearson correlations to investigate the associations between illness perception, coping style, and self-management. Multiple stepwise regression was used to assess whether general patient information, illness perceptions and coping style could significantly influence self-management.

Results

Participant Characteristics

A total of 246 patients were included and completed the questionnaires (93.89% response rate). The demographic and clinical characteristics of the sample are shown in Table 1. The mean age of the participants was 48.41 years. The majority of patients were male (63.4%). All patients had at least one comorbidity. About 75.6% of patients had no history of peritonitis, and all had received health education, including 38.6% who had received 3 or more health education sessions.

Table 1 Patient and Clinical Characteristics (N = 246)

Variable	*N* (%)	Mean (SD)
Sex		
Male	156 (63.4)	
Female	90 (36.6)	
Age (years)		48.41 (14.20)
≤45	117 (47.6)	
46~59	74 (30.1)	
≥60	55 (22.4)	
Educational level		
Primary school or below	37 (15.0)	
Junior high school	74 (30.1)	
Senior high school	58 (23.6)	
Junior college or above	77 (31.3)	

(*Continued*)

Table 1 (Continued).

Variable	*N* (%)	Mean (SD)
Marital status		
Married	192 (78.0)	
Unmarried/divorced/widowed	54 (22.0)	
Monthly income (RMB)		
<1000	55 (22.4)	
1000~3000	86 (35.0)	
3000~5000	52 (21.1)	
>5000	53 (21.5)	
Employment		
Employed	66 (26.8)	
Unemployed	180 (73.2)	
Social insurance		
Yes	245 (99.6)	
No	1 (0.4)	
Primary kidney disease		
Chronic glomerulonephritis	21 (8.5)	
Diabetes mellitus	57 (23.2)	
Hypertension	81 (32.9)	
Others	87 (35.4)	
Dialysis duration (month)		23.66 (22.83)
≤12	100 (40.7)	
13~24	68 (27.6)	
≥25	78 (31.7)	
Operator		
Patients	230 (93.5)	
Others	16 (6.5)	
Complications		
1	110 (44.7)	
2	72 (29.3)	
≥3	64 (26.0)	
History of PDAP		
No	186 (75.6)	
Yes	60 (24.4)	
Health education (times)		
1	94 (38.2)	
2	57 (23.2)	
≥3	95 (38.6)	

Abbreviation: SD, standard deviation.

Illness Perceptions, Coping Style and Self-Management

The mean scores and standard deviations for illness perception, coping style and self-management are shown in Table 2. Regarding illness perception (BIPQ), the mean scores for cognitive representations, emotional representations, and illness comprehensibility were 30.40 (SD = 6.86), 14.14 (SD = 3.14), and 2.87 (SD = 1.80), respectively. Higher scores were noted on timeline, consequences, concern, and emotions. Moderate scores were noted on identity, and personal control. Lowest score was seen on illness comprehensibility. Regarding coping style (MCMQ), the mean scores for confrontation, avoidance and resignation-acceptance were 18.55 (SD = 3.50), 14.91 (SD = 2.84) and 11.84 (SD = 3.42), respectively. In terms of self-management, the dimension "fluid change technical operation" received the highest score 2.72 (SD = 0.32), while "emotional management and social regression" obtained the lowest 1.90 (SD = 0.60).

Table 2 Descriptive Statistics of Participant measures

Variables	No. of Items	Mean ± SD
Illness perception	9	47.45±9.37
Cognitive illness representations	5	30.40±6.86
Consequences	1	7.30±2.41
Timeline	1	8.81±1.71
Personal Control	1	4.76±1.91
Treatment Control	1	3.57±1.81
Identity	1	5.96±2.12
Emotional representations	2	14.18±3.14
Concern	1	7.86±1.46
Emotions	1	6.32±2.53
Illness comprehensibility	1	2.87±1.80
Coping style	20	
Confrontation	8	18.55±3.50
Avoidance	7	14.91±2.84
Acceptance–resignation	5	11.84±3.42
Self-management	28	67.46±9.23
Fluid change technical operation	7	19.01±2.25
Abnormal situation handling	4	10.25±1.87
Dietary management	5	11.94±2.48
Complication monitoring	8	18.65±3.83
Emotional management and social regression	4	7.62±2.39

Abbreviation: SD, standard deviation.

Correlation Analysis of Illness Perception, Coping Style, and Self-Management

The results of the correlational analyses between illness perception, coping style and self-management are shown in Table 3. It showed that apart from illness concern, the main dimensions of illness perception were negatively correlated with self-management. Of the three dimensions of coping style, the confrontation and avoidance dimension were positively related to self-management, while acceptance-resignation was negatively related.

Table 3 Correlation of Illness Perception, Coping Style and Self-Management

Items	Self-Management (*r*)
Illness perception	
Total score	−0.235**
Cognitive illness representations	−0.237**
Consequences	−0.149*
Timeline	−0.156*
Personal Control	−0.226**
Treatment Control	−0.172**
Identity	−0.123
Emotional representations	−0.027
Concern	0.246**
Emotions	−0.177**
Illness comprehensibility	−0.269**
Coping style	
Confrontation	0.406**
Avoidance	0.149*
Acceptance–resignation	−0.452**

Notes: *$P<0.05$, **$P<0.01$, r: correlation.

Factors of Self-Management

Univariate analysis (Table 4) revealed that the variables age, sex, monthly income, operator, number of complications and health education times were significantly associated with self-management at the $P < 0.05$ level. And the results of the correlational analyses revealed that the cognitive illness representations, illness comprehensibility and all dimensions of coping style were related to self-management. Therefore, these variables were included in the multivariate analysis (Table 5). The result of Model 1 ($F = 9.639$, $p < 0.01$, $R^2 = 0.175$) showed that the 17.5% of the variation in self-management could be explained by socio-demographic variables. The effects of sex, age, monthly income and operator on self-management were significant. In Model 2 ($F = 10.594$, $p < 0.01$, $R^2 = 0.239$), when two dimensions of illness perception were added as independent variables while controlling for sociodemographic variables, all these variables explained 23.9% of the variation in self-management, of which 6.4% were explained by illness perception. These variables of sex, age, monthly income, cognitive illness representations and illness comprehensibility were recognized as significant predictors of self-management in Model 2. However, the operator was no longer significant. In Model 3 ($F = 12.385$, $p < 0.01$, $R^2 = 0.338$), all dimensions of coping style were included in regression model and explained an additional 9.9% of the variance of self-management.

Table 4 Associations Between Background Variables and Self-Management

Variable	*X±S*	*t/F*	*P* value
Sex			
Male	66.24±9.17	−2.765	0.006**
Female	69.58±9.01		
Age (years)			
≤45	69.44±9.96	5.818	0.003**
46~59	66.38±7.97		
≥60	64.73±8.38		
Educational level			
Primary school or below	65.51±8.22	0.843	0.472
Junior high school	67.70±8.22		
Senior high school	67.17±9.81		
Junior college or above	68.39±10.14		
Marital status			
Married	67.87±10.76	−0.366	0.715
Unmarried/divorced/widowed	51.79±14.38		
Monthly income (RMB)			
<1000	64.27±9.24	6.204	<0.001**
1000~3000	66.30±9.02		
3000~5000	69.13±9.53		
>5000	71.02±7.87		
Employment			
Employed	69.24±8.65	1.839	0.067
Unemployed	66.81±9.37		
Social insurance			
Yes	67.43±9.23	0.926	0.355
No	76.00		
Primary kidney disease			
Chronic glomerulonephritis	68.76±8.91	2.352	0.073
Diabetes mellitus	64.68±10.17		
Hypertension	67.95±9.33		
Others	68.52±8.31		

(*Continued*)

Table 4 (Continued).

Variable	*X±S*	*t/F*	*P* value
Dialysis duration (month)			
≤12	67.51±9.64	0.040	0.961
13~24	67.21±10.10		
≥25	67.63±7.93		
Operator			
Patients	68.00±9.07	3.507	0.001**
Others	59.81±8.35		
Complications			
1	69.32±8.43	4.249	0.015*
2	66.33±10.05		
≥3	65.55±9.13		
History of PDAP			
No	67.98±9.16	1.561	0.120
Yes	65.85±9.35		
Health education (times)			
1	65.60±9.51	3.174	0.044*
2	68.72±9.63		
≥3	68.56±8.47		

Notes: *P<0.05, **P<0.01.

Table 5 Regression Models Between Illness Perception Items, Patient Characteristics, Coping Styles and Dependent Variable Self-Management

Models	Variables	B	β	t	P	F	Adjusted R^2
Model 1	Sex	−3.587	−0.188	−3.184	0.002	9.639**	0.175
	Age	−0.113	−0.174	−2.656	0.008		
	Monthly income	2.241	0.258	4.329	<0.001		
	Operator	4.687	0.125	2.013	0.045		
	Complications	−0.472	−0.042	−0.656	0.513		
	Health education times	1.087	0.103	1.761	0.079		
Model 2	Sex	−3.305	−0.173	−3.048	0.003	10.594**	0.239
	Age	−0.163	−0.250	−3.843	<0.001		
	Monthly income	1.769	0.203	3.484	0.001		
	Operator	3.181	0.085	1.401	0.162		
	Complications	0.150	0.013	0.212	0.832		
	Health education times	0.771	0.073	1.265	0.207		
	Cognitive illness representations	−0.247	−0.184	−3.026	0.003		
	Illness comprehensibility	−0.868	−0.169	−2.785	0.006		
Model 3	Sex	−3.238	−0.169	−3.161	0.002	12.385**	0.338
	Age	−0.102	−0.156	−2.495	0.013		
	Monthly income	1.418	0.163	2.962	0.003		
	Operator	1.216	0.033	0.568	0.570		
	Complications	0.297	0.026	0.449	0.654		
	Health education times	0.410	0.039	0.717	0.474		
	Cognitive illness representations	−0.097	−0.072	−1.122	0.263		
	Illness comprehensibility	−0.798	−0.156	−2.695	0.008		
	Confrontation	0.517	0.196	3.057	0.002		
	Avoidance	0.022	0.007	0.119	0.906		
	Acceptance–resignation	−0.643	−0.238	−3.536	<0.001		

Notes: **P<0.01.

Discussion

Illness perception, coping style and self-management are closely related. When faced with stressful stimuli, individuals can influence self-management both directly through a range of physiological responses (mainly in the form of a multi-system chain of changes in the autonomic and neuroendocrine systems) and indirectly through coping style.[42,43] Based on the CSM model, this study examined the relationship between illness perception (environmental stimuli), coping style and self-management (adaptive behaviour) in patients with peritoneal dialysis. To our knowledge, this is the first study to investigate the relationship between self-management, illness perception and coping style in Chinese patients with PD.

Illness representation was assessed using the BIPQ. High levels of timeline were followed by consequences, concern, emotions, identity and personal control. High scores on timeline and consequences were consistent with poor self-management, as patients experienced a long course and many negative consequences of their illness. Emotional representation of illness (emotional and concern) indicated that patients were very concerned about their illness. They often experienced anger, anxiety and low mood. Low scores in the personal and treatment control domain of the BIPQ suggest that patients have low expectations of treatment and lack control over their illness.

The results of the correlation analysis in this paper show that peritoneal dialysis patients' illness perceptions have a negative effect on self-management, consistent with previous studies.[44,45] Most of the BIPQ domains have a significant correlation with self-management. This means that people are likely to have poor self-management if they have a poor perception of the consequences of the illness, a stronger illness identity, negative emotional reactions to the illness and poor perceived controllability (treatment and personal). In terms of the patient's experience of the disease and its evolution, if the patient has a poor perception and understanding of the disease, the patient's psychological state is negative, and this group of patients tends to receive less social support and therefore their level of self-management is poor.

Cognitive illness representations and illness comprehensibility was found to be negatively associated with total self-management. This suggests that greater knowledge and understanding of their condition is associated with less self-management. This finding is similar to Liu et al.[46] However, Sherman[47] and Moss-Morris[48] believe that patients who have a more coherent understanding of their illness may be able to adopt protective behaviors, such as seeking medical advice and making longer-term adjustments. This may be because although a certain level of understanding of the disease can increase a patient's awareness of self-care, peritoneal dialysis is characterized by a long and complex course of disease and a poor prognosis. As patients learn more about the causes, mechanisms and prognosis of the disease, and as they experience more symptoms, they become more aware of the severity of the disease, which increases their anxiety and affects their self-management. As a psychological variable, illness perceptions can have a significant impact on patients' psychological state. Positive illness perceptions can increase patients' confidence in coping style with illness, improve health literacy and enhance self-management. Conversely, the more serious the negative perception of the disease, the more likely the person is to believe that they cannot change their morbid state, which leads to burnout and unable to maintain self-management.[49,50] Hence, it is suggested that health professionals should be careful to provide correct and useful information when providing health education, and reduce the output of invalid information so as not to increase patients' nervousness and anxiety. For example, different educational methods can be used for patients from different cultural backgrounds to make it easier for them to grasp the relevant knowledge.

The main finding of this study was that in a multivariate analysis, patients' sex, age, monthly income, one aspect of illness perception (illness comprehensibility) and two aspects of coping style (confrontation and acceptance-resignation) explained 33.8% of the variance in self-management in patients with PD. Female, younger age and higher monthly income were significant predictors of PD self-management. Possible explanations are that (a) The social roles taken on by the sexes vary. Compared to men, women assume more caring roles in daily life and family relationships, such as laundry and cooking, cleaning and caring for relatives. At the same time, women tend to be more detail-oriented, image-conscious and emotionally sensitive, so they tend to be better at dietary and volume compliance;[51] (b) older patients have reduced cognitive abilities and are less able to monitor their condition and manage abnormalities, and therefore have poor self-management skills;[52] and (c) Maslow's Hierarchy of Needs theory suggests that only when basic physiological needs are met can people pursue higher-level needs. Patients with high family incomes are materially better off, have less stressful lives and have more time and energy to focus on their health.[53]

With regard to coping style, compared with the previous study,[39] our patients were more likely to adopt a resignation coping style, and several studies have shown that a resignation coping style is highly correlated with poor physical, adherence and bad quality of life.[30,54,55] In our study, confrontation is positively related to self-management, whereas acceptance-resignation is negatively related. The reasons for this may be: as a positive coping style, confrontation patients actively communicate with medical staff about the illness and self-care, are willing to talk to others about negative feelings, adjust their attitudes, and actively seek outside support. Conversely, patients who have an acceptance-resignation approach to their illness are more likely to have a loss of self-confidence, to be less compliant and to give in to the illness, so they are less able to manage themselves. Therefore, in order to prevent negative emotions and non-adherence to treatment, interventions to improve the coping style of people with PD should be carried out.

Limitations

There are some limitations in this study. First, this study only selected patients who were admitted to two tertiary hospitals in Wuhan, which may have sampling errors, and the sample size is still small, though meeting the statistical demands, so the representativeness and generalizability of the results of this study may have limitations, further multicenter and large-sample studies should be carried out in the future to verify the present findings. Second, in this study, less than 20% of the variance in self-management was explained by illness perception and coping style. Further research is needed to explore whether other variables influence self-management in the future. Finally, the CSM model provided a theoretical basis for the study hypothesis. However, due to the cross-sectional nature of this study, it was not possible to determine the dynamics of self-management levels in peritoneal dialysis patients or to clarify the causal relationships between the variables. A longitudinal study design could be used in the future to explore trends in self-management over time and the mechanisms involved.

Conclusions

In conclusion, despite the small amount of variation in self-management that could be explained by patients' illness perceptions and coping style, this study shows that these two variables can have a significant impact on the self-management of people with PD.

The findings suggest that patients with PD are more likely to adopt positive coping style to improve self-management when they experience positive illness perception. Therefore, early targeted intervention to increase adaptive illness perception and guide them to adopt positive coping strategies seems to be necessary for improving the self-management of stroke patients with PD. For example, physical and emotional rehabilitation, coping strategies, support networking, and occupational counseling. A tailored intervention must be designed by a multidisciplinary team of practitioners, such as psychological and occupational professionals. Health care providers should be earlier aware of patient situations and discuss with them and their families to provide individualized recommendations that provide opportunities and options. Meanwhile, a communication meeting with other patients could be set up to encourage patients to share their own experiences and cognitions about their disease. This could help to reduce patients' negative emotions, improve negative perceptions, promote self-regulation and increase their confidence in fighting the disease.

Reporting Method

The study adhered to "STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies".

Data Sharing Statement

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

Ethics Approval

The survey strictly followed the principles of the Helsinki Declaration and was approved by the Ethics Committee of Zhongnan Hospital of Wuhan University (ID: 2022088K). Before filling out the questionnaire, we informed patients

about the purpose of this study and ensure that their personal privacy would not be disclosed. All the patients provided informed consent prior to their inclusion in the study. All methods were carried out in accordance with relevant guidelines and regulations.

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Disclosure

This paper is available as a preprint on Research Square at: https://www.researchsquare.com/article/rs-3610367/v1

The author(s) affirm that the methods used in the data analyses are suitably applied to their data within their study design and context, and the statistical findings have been implemented and interpreted correctly.

The authors report no conflicts of interest in this work.

References

1. Tan CC, Chan CM, Ho CK, Wong KS, Lee EJC, Woo KT. Health economics of renal replacement therapy: perspectives from Singapore. *Kidney Int*. 2005;67:S19–S22. PubMed PMID: WOS:000227251000005. doi:10.1111/j.1523-1755.2005.09405.x
2. Jha V, Garcia-Garcia G, Iseki K, et al. Chronic kidney disease: global dimension and perspectives. *Lancet*. 2013;382(9888):260–272. PubMed PMID: WOS:000322543700036. doi:10.1016/s0140-6736(13)60687-x
3. Saran R, Robinson B, Abbott KC, et al. US renal data system 2019 annual data report: epidemiology of kidney disease in the United States. *Am J Kidney Dis*. 2020;75(1):SVI–SVII. PubMed PMID: WOS:000503375200001. doi:10.1053/j.ajkd.2019.09.003
4. Li PK, Chow KM, Van de Luijtgaarden MWM, et al. Changes in the worldwide epidemiology of peritoneal dialysis. *Nat Rev Nephrol*. 2017;13(2):90–103. PubMed PMID: WOS:000393255700008. doi:10.1038/nrneph.2016.181
5. Li PK, Chow KM. Peritoneal dialysis-first policy made successful: perspectives and actions. *Am J Kidney Dis*. 2013;62(5):993–1005. PubMed PMID: WOS:000325985600020. doi:10.1053/j.ajkd.2013.03.038
6. Rivara MB, Mehrotra R. The changing landscape of home dialysis in the United States. *Curr Opin Nephrol Hypertens*. 2014;23(6):586–591. PubMed PMID: WOS:000343870300010. doi:10.1097/mnh.0000000000000066
7. Fresenius Medical Care. Fresenius medical care 2015 annual report: ESRD patients in 2015: a global perspective (FMC 2015); 2015.
8. Liyanage T, Ninomiya T, Jha V, et al. Worldwide access to treatment for end-stage kidney disease: a systematic review. *Lancet*. 2015;385(9981):1975–1982. PubMed PMID: WOS:000354541700031. doi:10.1016/s0140-6736(14)61601-9
9. NI Zhao Hui JH. The developmental history of peritoneal dialysis in China in the 70 years. *Chin J Blood Purif*. 2019;18(10):661–663. doi:10.3969/j.issn.1671-4091.2019.10.001
10. Bi SH, Chen W, Wu JS, Wang T, Ahmad S. The history of peritoneal dialysis in China: past, present and future trends. *Ren Fail*. 2021;43(1):1601–1608. PubMed PMID: 34865609; PubMed Central PMCID: PMCPMC8648012. doi:10.1080/0886022x.2021.2011316
11. Epping-Jordan J, Bengoa R, Kawar R, Sabaté E. The challenge of chronic conditions: WHO responds. *BMJ*. 2001;323(7319):947–948. PubMed PMID: 11679371; PubMed Central PMCID: PMCPMC1121495. doi:10.1136/bmj.323.7319.947
12. Lozano P, Houtrow A. Supporting self-management in children and adolescents with complex chronic conditions. *Pediatrics*. 2018;141(Suppl 3):S233–s41. PubMed PMID: 29496974. doi:10.1542/peds.2017-1284H
13. Armour M, Sinclair J, Chalmers KJ, Smith CA. Self-management strategies amongst Australian women with endometriosis: a national online survey. *BMC Complement Altern Med*. 2019;19(1):17. PubMed PMID: 30646891; PubMed Central PMCID: PMCPMC6332532. doi:10.1186/s12906-019-2431-x
14. Pengfei LIU, Yumei SUN, Qian LU, Tao WANG. Analyse on the relationship between self-management behavior and self-efficacy of peritoneal dialysis patients. *Chin J Nurs*. 2006;41:615–617.
15. Lameire NH. The impact of residual renal function on the adequacy of peritoneal dialysis. *Nephron*. 1997;77(1):13–28. PubMed PMID: 9380234. doi:10.1159/000190242
16. McGillion MH, Watt-Watson J, Stevens B, LeFort SM, Coyte P, Graham A. Randomized controlled trial of a psychoeducation program for the self-management of chronic cardiac pain. *J Pain Sympt Manage*. 2008;36(2):126–140. PubMed PMID: WOS:000258389900003. doi:10.1016/j.jpainsymman.2007.09.015
17. Otsu H, Moriyama M. Effectiveness of an educational self-management program for outpatients with chronic heart failure. *Japan J Nurs Sci*. 2011;8(2):140–152. PubMed PMID: WOS:000298017500004. doi:10.1111/j.1742-7924.2010.00166.x
18. Chen SH, Tsai YF, Sun CY, Wu IW, Lee CC, Wu MS. The impact of self-management support on the progression of chronic kidney disease-a prospective randomized controlled trial. *Nephrol Dial Transplant*. 2011;26(11):3560–3566. PubMed PMID: WOS:000296350400022. doi:10.1093/ndt/gfr047
19. Leventhal H, Phillips LA, Burns E. The common-sense model of self-regulation (CSM): a dynamic framework for understanding illness self-management. *J Behav Med*. 2016;39(6):935–946. PubMed PMID: 27515801. doi:10.1007/s10865-016-9782-2

20. Leventhal H, Safer MA, Panagis DM. The impact of communications on the self-regulation of health beliefs, decisions, and behavior. *Health Educ Q*. 1983;10(1):3–29. PubMed PMID: 6629788. doi:10.1177/109019818301000101
21. Hagger MS, Koch S, Chatzisarantis NLD, Orbell S. The common sense model of self-regulation: meta-analysis and test of a process model. *Psychol Bull*. 2017;143(11):1117–1154. PubMed PMID: 28805401. doi:10.1037/bul0000118
22. Vélez-Vélez E, Bosch RJ. Illness perception, coping style and adherence to treatment among patients with chronic kidney disease. *J Adv Nurs*. 2016;72(4):849–863. PubMed PMID: 26689295. doi:10.1111/jan.12873
23. Kaptein AA, Bijsterbosch J, Scharloo M, Hampson SE, Kroon HM, Kloppenburg M. Using the common sense model of illness perceptions to examine osteoarthritis change: a 6-year longitudinal study. *Health Psychol*. 2010;29(1):56–64. PubMed PMID: 20063936. doi:10.1037/a0017787
24. Knibb RC, Horton SL. Can illness perceptions and coping style predict psychological distress amongst allergy sufferers? *Br J Health Psychol*. 2008;13(Pt 1):103–119. PubMed PMID: 17535490. doi:10.1348/135910706x173278
25. Ross S, Walker A, MacLeod MJ. Patient compliance in hypertension: role of illness perceptions and treatment beliefs. *J Hum Hypertens*. 2004;18 (9):607–613. PubMed PMID: 15029218. doi:10.1038/sj.jhh.1001721
26. Gomez-de-Regil L, Kwapil TR, Barrantes-Vidal N. Illness perception mediates the effect of illness course on the quality of life of Mexican patients with psychosis. *Appl Res Qual Life*. 2014;9(1):99–112. PubMed PMID: WOS:000330969000006. doi:10.1007/s11482-013-9211-4
27. Petrie KJ, Weinman J. Patients' Perceptions of Their Illness: the Dynamo of Volition in Health Care. *Curr Direc Psycholog Sci*. 2012;21(1):60–65. PubMed PMID: WOS:000305120600011. doi:10.1177/0963721411429456
28. Hale ED, Treharne GJ, Kitas GD. The common-sense model of self-regulation of health and illness: how can we use it to understand and respond to our patients' needs? *Rheumatology*. 2007;46(6):904–906. PubMed PMID: 17449488. doi:10.1093/rheumatology/kem060
29. Feifel H, Strack S, Nagy VT. coping style strategies and associated features of medically ill patients. *Psychosom Med*. 1987;49(6):616–625. PubMed PMID: 3423168. doi:10.1097/00006842-198711000-00007
30. Albai A, Sima A, Papava I, Roman D, Andor B, Gafencu M. Association between coping style mechanisms and adherence to diabetes-related self-care activities: a cross-sectional study. *Patient Prefer Adherence*. 2017;11:1235–1241. PubMed PMID: 28761336; PubMed Central PMCID: PMCPMC5522817. doi:10.2147/ppa.S140146
31. Ilioudi S, Lazakidou A, Tsironi M. Information and communication technologies for better patient self-management and self-efficacy. *Int J Electron Healthc*. 2010;5(4):327–339. PubMed PMID: 21041173. doi:10.1504/ijeh.2010.036205
32. Arran N, Craufurd D, Simpson J. Illness perceptions, coping style styles and psychological distress in adults with Huntington's disease. *Psychol Health Med*. 2014;19(2):169–179. PubMed PMID: 23767964. doi:10.1080/13548506.2013.802355
33. Woodhouse S, Hebbard G, Knowles SR. Exploring Symptom Severity, Illness Perceptions, coping style Styles, and Well-Being in Gastroparesis Patients Using the Common Sense Model. *Dig Dis Sci*. 2018;63(4):958–965. PubMed PMID: 29468373. doi:10.1007/s10620-018-4975-x
34. Hoogland JJ, Boomsma A. Robustness studies in covariance structure modeling - An overview and a meta-analysis. *Sociol Methods Res*. 1998;26 (3):329–367. PubMed PMID: WOS:000071856000004. doi:10.1177/0049124198026003003
35. Broadbent E, Petrie KJ, Main J, Weinman J. The brief illness perception questionnaire. *J Psychosom Res*. 2006;60(6):631–637. PubMed PMID: 16731240. doi:10.1016/j.jpsychores.2005.10.020
36. Rogante E, Sarubbi S, Lamis DA, et al. Illness perception and job satisfaction in patients suffering from migraine headaches: trait anxiety and depressive symptoms as potential mediators. *Headache*. 2019;59(1):46–55. PubMed PMID: 30548860. doi:10.1111/head.13461
37. Grunfeld EA, Low E, Cooper AF. Cancer survivors' and employers' perceptions of working following cancer treatment. *Occup Med (Lond)*. 2010;60(8):611–617. PubMed PMID: 20855546. doi:10.1093/occmed/kqq143
38. Chen YJ, Lai YH, Lee YH, Tsai KY, Chen MK, Hsieh MY. Impact of illness perception, mental adjustment, and sociodemographic characteristics on return to work in patients with head and neck cancer. *Support Care Cancer*. 2021;29(3):1519–1526. PubMed PMID: 32720008. doi:10.1007/s00520-020-05640-5
39. Shen XH, Jiang QJ. Report on application of Chinese version of MCMQ in 701 patients. *Chin J Behav Med Sci*. 2000;9:18–20.
40. Cai L, Shan Y, Li YY, et al. Mediating effect of self-esteem level on family function and coping style styles of young and middle aged peritoneal dialysis patients. *Mod Preventive Med*. 2020;47:2085–2088.
41. Pang JH, Wang F. Cross-sectional study and influencing factors of self-management ability in patients undergoing continuous ambulatory peritoneal dialysis. *Chinese Journal of Practical Nursing|Chin J Prac Nurs*. 2014;30(14):62–65.
42. Dempster M, Howell D, McCorry NK. Illness perceptions and coping style in physical health conditions: a meta-analysis. *J Psychosom Res*. 2015;79(6):506–513. PubMed PMID: 26541550. doi:10.1016/j.jpsychores.2015.10.006
43. O'Connor DB, Thayer JF, Vedhara K. Stress and health: a review of psychobiological processes. *Annu Rev Psychol*. 2021;72:663–688. PubMed PMID: 32886587. doi:10.1146/annurev-psych-062520-122331
44. Xiong C, Jiang C, Zhang H, et al. Self-management and illness perception among cervical cancer patients: a cross-sectional study. *Int J Nurs Pract*. 2023:e13130. PubMed PMID: 36708017. doi:10.1111/ijn.13134
45. Ajuwon AM, Insel K. Health literacy, illness perception, depression, and self-management among African Americans with type 2 diabetes. *J Am Assoc Nurse Pract*. 2022;34(9):1066–1074. PubMed PMID: 35944227. doi:10.1097/jxx.0000000000000763
46. Liu Y, Wei M, Guo L, Guo Y, Zhu Y, He Y. Association between illness perception and health behaviour among stroke patients: the mediation effect of coping style style. *J Adv Nurs*. 2021;77(5):2307–2318. PubMed PMID: 33481272. doi:10.1111/jan.14761
47. Sherman KA, Kilby CJ, Elder E, Ridner SH. Factors associated with professional healthcare advice seeking in women at risk for developing breast cancer-related lymphedema. *Patient Educ Couns*. 2018;101(3):445–451. PubMed PMID: 29107400. doi:10.1016/j.pec.2017.10.010
48. Moss-Morris R, Weinman J, Petrie KJ, Horne R, Cameron LD, Buick D. The revised Illness Perception Questionnaire (IPQ-R). *Psychol Health*. 2002;17(1):1–16. PubMed PMID: WOS:000176071800001. doi:10.1080/08870440290001494
49. Richardson EM, Schüz N, Sanderson K, Scott JL, Schüz B. Illness representations, coping style, and illness outcomes in people with cancer: a systematic review and meta-analysis. *Psychooncology*. 2017;26(6):724–737. PubMed PMID: 27412423. doi:10.1002/pon.4213
50. Law GU, Tolgyesi CS, Howard RA. Illness beliefs and self-management in children and young people with chronic illness: a systematic review. *Health Psychol Rev*. 2014;8(3):362–380. PubMed PMID: 25053219. doi:10.1080/17437199.2012.747123
51. Rakowski W, Julius M, Hickey T, Verbrugge LM, Halter JB. Daily symptoms and behavioral responses. Results of a health diary with older adults. *Med Care*. 1988;26(3):278–297. PubMed PMID: 3352325. doi:10.1097/00005650-198803000-00005

52. Berner C, Erlacher L, Fenzl KH, Dorner TE. A cross-sectional study on self-reported physical and mental health-related quality of life in rheumatoid arthritis and the role of illness perception. *Health Qual Life Outcomes*. 2018;16(1):238. PubMed PMID: 30567550; PubMed Central PMCID: PMCPMC6299971. doi:10.1186/s12955-018-1064-y
53. Hale AJ, Ricotta DN, Freed J, Smith CC, Huang GC. Adapting Maslow's hierarchy of needs as a framework for resident wellness. *Teach Learn Med*. 2019;31(1):109–118. PubMed PMID: 29708437. doi:10.1080/10401334.2018.1456928
54. Tang GX, Yan PP, Yan CL, et al. Determinants of suicidal ideation in gynecological cancer patients. *Psychooncology*. 2016;25(1):97–103. PubMed PMID: 26103593. doi:10.1002/pon.3880
55. Vaske I, Kenn K, Keil DC, Rief W, Stenzel NM. Illness perceptions and coping style with disease in chronic obstructive pulmonary disease: effects on health-related quality of life. *J Health Psychol*. 2017;22(12):1570–1581. PubMed PMID: 26929168. doi:10.1177/1359105316631197