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Study on the Mediating Effect of Disease Acceptance between Community Self-efficacy and Social Isolation in Elderly with Parkinson's Disease

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Abstract

Purpose: To investigate the status quo of disease acceptance, community self-efficacy, and social isolation in elderly patients with Parkinson's disease, to explore the influencing factors and the correlation among them, and to explore the mediation between disease acceptance and community self-efficacy and social isolation effect.

Methods: A convenient selection of elderly patients with Parkinson's disease in outpatient clinics of two tertiary hospitals in Guangdong Province was carried out using the general information questionnaire, Lubben social network scale, community self-efficacy scale, and disease acceptance scale. A total of 157 questionnaires were distributed, including 142 valid questionnaires.

Result: The average community self-efficacy score of 142 elderly Parkinson's patients was (11.03±6.21), the average social network score was (13.29±5.4), and the average disease acceptance score was (23.56±6.871); the community self-efficacy of elderly Parkinson's patients, social isolation, and disease acceptance ($P<0.01$); community self-efficacy was negatively correlated with social isolation ($r=0.621$, $P<0.01$), and community self-efficacy was positively correlated with disease acceptance ($r=0.471$, $P<0.01$), disease acceptance was negatively correlated with social isolation ($r=0.387$, $P<0.01$). After adjusting covariates, disease acceptance had a partial mediating effect between community self-efficacy and social isolation, with a direct effect size of 83.9% and a mediating effect size of 16.1%.

Conclusion: Community disease acceptance, self-efficacy, and social isolation in elderly PD patients are correlated, and disease acceptance has a partial mediating effect between community self-efficacy and social isolation in elderly Parkinson's patients. Elderly PD patients should be actively encouraged to actively integrate into society, reduce the incidence of social isolation, improve community self-efficacy, and achieve the purpose of helping elderly PD patients control symptoms, delay disease progression, and improve their quality of life.

Keywords: Elderly Parkinson's disease; social isolation; community self-efficacy; disease acceptance

1. Introduction

Parkinson's disease (PD) is a common neurodegenerative disease in the elderly, mainly manifested as resting tremor, muscle rigidity, abnormal posture and gait, sleep disturbance, hyposmia, and other motor and non-motor symptoms (Armstrong & Okun, 2020). The prevalence of PD increases with age (Zhang Hui & Wang Yunliang, 2021), and as the population ages, the prevalence of PD will increase from 7 million in 2015 to 13 million in 2040 (Dorsey et al., 2018) [3]. PD is known as the "silent killer", which seriously endangers the physical and mental health of patients. Studies have shown that long-term treatment of elderly PD patients is often accompanied by negative emotions such as anxiety and depression, which affects the communication between patients and the outside world, reduces communication with others, and causes social isolation (M, D, F, Lindy, & Terry, 2018). Social isolation, also known as social isolation, is an active or passive derailment from society, where participation in activities, social interaction, and interpersonal communication is in a state of rupture or isolation, which induces a negative state of physiology and/or psychology (Yang Meifang, Zhao Jian, Shi Meihong, & Ju Mei, 2016), is a significant risk factor for the decline in physical activity in the elderly (M et al., 2018), so it is necessary to study how to reduce the incidence of social isolation.

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In addition, because PD patients need long-term medication and rehabilitation to control symptoms, their self-management is very important, and community self-efficacy is an important way to reflect the self-management ability of PD patients, and an important factor to predict the health behavior change of patients with chronic diseases (Guo Limin , Li Lezhi, Lu Yanfang, & Wen Shali, 2021), while the acceptance of disease plays an important role in patient self-management (Mateusz, Lukasz, Elzbieta, & Urszula, 2017), disease acceptance refers to the relationship between patients and themselves The disease has reached a compromise, can make a realistic assessment of its own disease, and has the motivation to fight against the disease (Cipora, Konieczny, & Sobieszczański, 2018), studies have found that patients with high community self-efficacy are better able to self-manage the disease (Liu Lin et al., 2019), the higher the disease acceptance is, and the patients with higher disease acceptance gradually get used to the inconvenience caused by the disease and reduce negative emotions, which helps patients expand their range of activities (Kurpas, Mroczek, & Bielska, 2013), improving their social isolation.

Most of the current research on social isolation focuses on developing interventions to help the elderly combat social isolation (Bei, 2020) (A, K, & Michael, 2020) (Amy & Jennifer, 2020), social isolation for elderly patients with specific diseases There are few studies, and studies on the social isolation status of Parkinson's patients have not been reported. Although there are many studies on self-efficacy and disease acceptance, the research that links social isolation, community self-efficacy, and disease acceptance in elderly patients with Parkinson's disease has certain particularity and unique significance. Based on this, this study investigates the community self-efficacy, disease acceptance, and social isolation status of PD patients explores the correlation among the three and provides a theoretical basis for the treatment and care of elderly Parkinson's patients.

2. Methods

2.1 Object

From November 2021 to April 2022, a questionnaire survey was conducted among elderly PD patients who were outpatients in two tertiary hospitals in Guangdong Province. A total of 157 questionnaires were collected, of which 142 were valid, with an effective rate of 90.44%.

Inclusion criteria: (1) Diagnosed with Parkinson's syndrome according to the "Diagnostic Criteria for Parkinson's Disease in China (2016 Edition)" (Liu Jun, 2016); (2) Age ≥ 60 years old; (3) Clear consciousness and ability to complete Questionnaire; (4) informed consent and signed informed consent form; exclusion criteria; (1) persons with severe hearing impairment and unable to communicate; (2) persons with cognitive impairment, dementia, or other incomprehensible problems; (3) combined Those with other serious diseases; diagnostic criteria: according to the "Diagnostic Criteria for Parkinson's Disease in China (2016 Edition)" (Liu Jun, 2016) was diagnosed as Parkinson's syndrome. Diagnosis of Parkinsonism is based on three core motor symptoms, requisite bradykinesia, and at least one of resting tremor or muscle rigidity. Examination of all core motor symptoms must be performed as described in the Unified Parkinson's Rating Scale (UPDRS).

2.2 Survey tools

① General data characteristics questionnaire. The questionnaire was compiled by the researchers and included: sociodemographic characteristics, including gender, age, place of residence, education level, living arrangement, marital status, number of surviving children, monthly income, participation in intergenerational parenting, and use of social media, the resources of the place of residence, whether to participate in social activities, the severity of Parkinson's disease, etc. ② This scale is a simplified social network scale compiled by Lubben et al. (James et al., 2006) in 2006. It consists of three questions on kinship assessment and three questions on non-kinship (friend) relationship assessment. To assess the social isolation of patients. Each question is scored from 0 to 5 points, and the total score of the scale is the sum of the scores of each item, ranging from 0 to 30 points. The lower the score, the worse the social network status, and <12 points are considered to be social isolation. A score of <6 on the subscale was considered to be family isolation or friend isolation, and the Cronbach's α coefficient of the scale was 0.805. ③ Community's Self-Efficacy Scale (CSES) was compiled by Tadaka et al. (Tadaka et al., 2016) in 2016, and it was translated into Chinese by Jin Jiayao et al. (Jin Jiayao & Zhang Huijun, 2017) for evaluation Elderly community self-efficacy. The scale includes two dimensions: community network and neighborhood watch, with 4 items in each dimension, and each item is scored on a Likert 4 scale from 0 (unconfident) to 3 (confident), with a total score of 0 to 24, with higher scores, indicating that the stronger the sense of community self-efficacy, the Cronbach's α coefficient of the scale is 0.910. ④ Acceptance of Illness Scale (AIS) was translated into Chinese by Zhao Wenwen (Zhao Wenwen, 2018). The scale consists of 8 items describing the adverse consequences of the disease. Each item is scored on a 5-point Likert scale from 1 (strongly agree) to 5 (very disagree), with a total score of 8 to 40 points.

The lower the score, the worse the acceptance of the disease, <20 points indicate low acceptance, 20-30 points indicate moderate acceptance, >30 points indicate high acceptance, and the Cronbach's α coefficient of this scale is 0.868.

2.3 Data Collection Methods

Before the collection, the researcher communicated with the relevant departments of the hospital, introduced the purpose and content of the research, and obtained the support and consent of the nursing department of the hospital. From November 2021 to April 2022, a questionnaire survey will be conducted in the Neurology Clinic of the Eighth Affiliated Hospital of Sun Yat-sen University. The questionnaire will be distributed on the spot. The survey was done anonymously. During the survey, the researcher read out the questions one by one, asked them to choose and filled in truthfully. After the questionnaires are collected, check and supplement the missing items in time, and enter them into the database in time.

2.4 Statistical methods

Statistical analysis was performed using SPSS 20.0 software. Count data were described by case number and composition ratio, and measurement data were described by mean ± standard deviation (x ± s). Pearson correlation analysis was used to analyze disease acceptance, community self-efficacy, and social isolation. Correlation among them; using multiple linear regression statistics to infer the mediating effect of disease acceptance on social isolation and community self-efficacy, P <0.05 considered the difference to be statistically significant, using Process-bootsrast to analyze disease acceptance in elderly Parkinson's patients' Statistical inference for the mediating effect between community self-efficacy and social isolation.

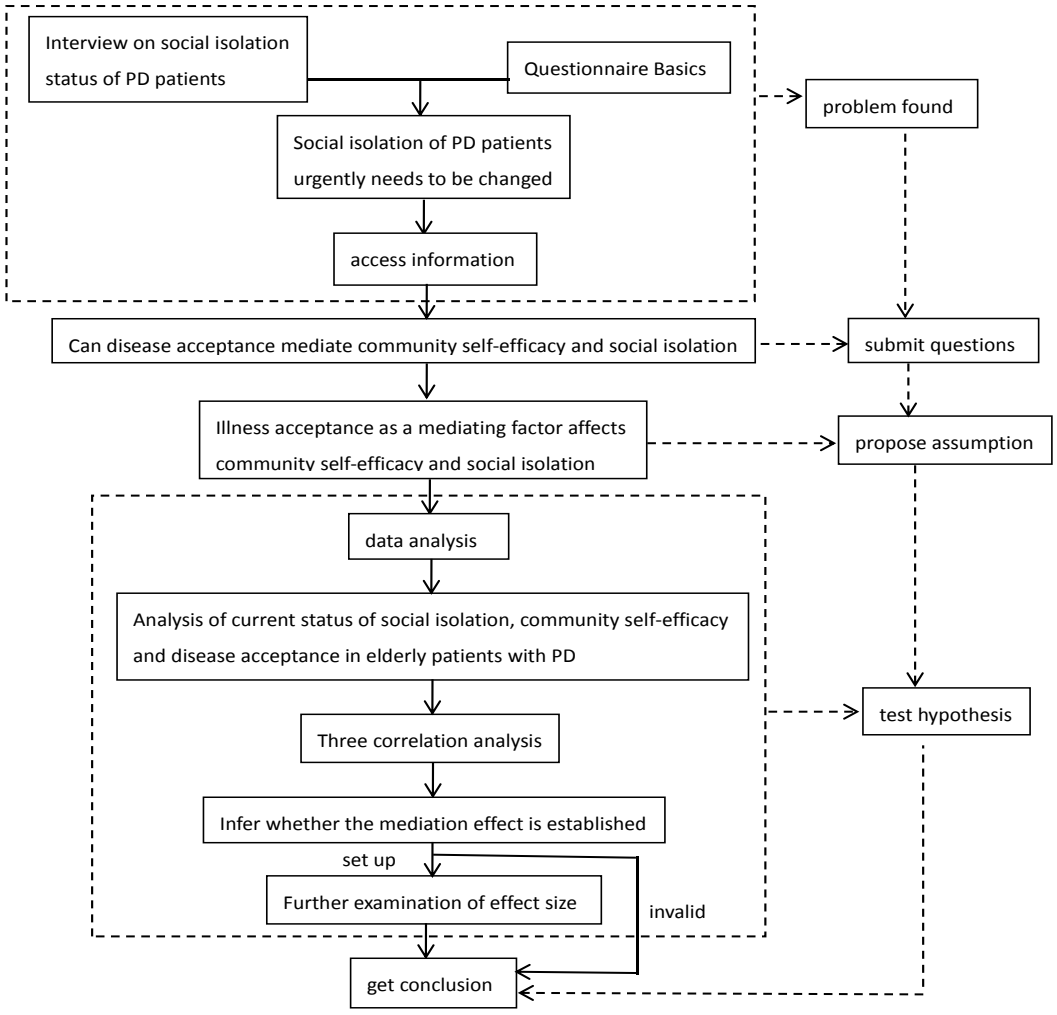

Figure 1 Research train of thought

3. Results

3.1 General data characteristics of elderly Parkinson's patients

In this study, 142 elderly PD patients were included in this study, ranging in age from 60 to 89 years old, with an average age of (69.30±5.34) years; 79 of them were males (55.6%) and 63 were females (44.3%), see Table 1 for details.

Table 1 Elderly PD patients—general data characteristics (N=142)

Item	Project	Mean ± Standard Deviation / Frequency (Percentage)
Age		69.30±5.34
Gender	Male	79（55.6）
	Female	63（44.3%）
Place of residence	The countryside	58（40.8）
	Town	84（59.1）
Education level	Junior high school and below	101（71.1）
	high school and above	39（28.8）
Marital status	Single (Single/Divorced/Widowed)	27（19）
	Married/Cohabiting	115（80.9）
Living arrangements	Living alone/Nursing home	13（9.1）
	Live with family	129（90.8）
Monthly income	< three thousand dollars	70（49.2）
	≥ three thousand dollars	72（50.7）
Surviving children	≤1	4（2.8）
	≥2	138（97.1）
Do you use social media?	Yes	60（42.2）
	No	82（57.7）
Whether to participate in social activities	Yes	64（45）
	No	78（54.9）
Parkinson's severity scale	≤Level 1.5	102（72.8）
	Level 2 and above	40（27.1）

3.2 Disease acceptance, community self-efficacy and social isolation in elderly patients with Parkinson's disease

See Table 2 for the scores of community self-efficacy, social network and disease acceptance in elderly PD patients.

Table 2 Descriptive analysis of disease acceptance, community self-efficacy and social isolation (N=142)

Project	Minimum value	Maximum value	Mean ± Standard Deviation / Frequency (Percentage)
Community self-efficacy	0	24	11.03±6.21
Social network	0	12	5.47±3.37
Neighborhood watch	0	12	5.56±3.26
Social network	1	28	13.29±5.4
Home network	1	15	7.3±2.69
Friend network	0	13	5.99±3.52
Social isolation			47(33.0)
Home isolation			27(19.0)
Friend isolation			53(37.3)
Disease acceptance	8	40	23.56±6.871
Low disease acceptance			44(30.9)
Moderate disease acceptance			72(50.7)
High disease acceptance			26(18.3)

3.3 Correlation analysis of social isolation, disease acceptance and community self-efficacy in elderly patients with Parkinson's disease

Pearson correlation analysis showed that there was a significant correlation between social isolation, disease acceptance, and community self-efficacy in elderly PD patients (P <0.01); the higher the social isolation score, the less likely social isolation would occur,

That is, the relationship between social isolation and disease acceptance There was a positive correlation between disease acceptance and community self-efficacy (P <0.01), see Table 3 for details.

Table 3 Correlation analysis of social isolation, disease acceptance, and community self-efficacy in elderly PD patients (N=142)

	community self-efficacy	objective society isolation	disease acceptance
Community self-efficacy	1		
Social isolation	.621**	1	
Disease acceptance	.471**	.387**	1

Note: ** means, P＜0.01

3.4 Analysis of the mediating effect of disease acceptance on community self-efficacy and social isolation in elderly patients with Parkinson's disease

According to the mediation effect test process, the relationship between disease acceptance, community self-efficacy, and social isolation in elderly PD patients was further explored. Taking community self-efficacy as the independent variable (X), disease acceptance as the mediator variable (M), and social isolation as the dependent variable (Y1), use Model 4 in the Process program to analyze the mediating effect, and analyze the influence of disease acceptance on community self-efficacy. The mediating effect between self-efficacy and social isolation. In the first step, community self-efficacy has a significant predictive effect on social isolation (c=0.539, P<0.001); in the second step, community self-efficacy has a predictive effect on disease acceptance (a=0.520, P<0.001), the third step is to test the impact of disease acceptance and community self-efficacy on social isolation, the coefficient c' is 0.490 (P<0.001), and the coefficient b is 0.095 (P>0.05), the difference is not statistically significant. After adjusting for covariates, c=0.442, P<0.001); in the second step, community self-efficacy has a predictive effect on disease acceptance (a=0.616, P<0.001); in the third step, testing disease acceptance, community The effect of self-efficacy on social isolation, coefficient c' is 0.371 (P<0.001), coefficient b is 0.116 (P<0.05), the difference is statistically significant. It shows that disease acceptance has a partial mediating effect between community self-efficacy and social isolation, see Table 4 for details.

Table 4 Analysis of the mediating effect of disease acceptance on the relationship between objective self-efficacy and social isolation in elderly patients with Parkinson's disease

step	independent variable	dependent variable	*β*		*t*		R^2	
			model 1	model 2	model 1	model 2	model 1	model 2
first step	X	Y1	0.539	0.442	9.379**	6.347**	0.386	0.442
second step	X	M	0.520	0.616	6.310**	6.070**	0.221	0.238
third step	X	Y1	0.490	0.371	7.558**	4.777**	0.397	0.433
	M		0.095	0.116	1.628	1.997*		

Note: X is community self-efficacy, Y1 is social isolation, M is disease acceptance
** is P<0.001, * is P<0.05

Note: Model 1: without adjusting any variables; Model 2: after adjusting covariates

3.5 Test of the mediating effect of disease acceptance on the relationship between community self-efficacy and social isolation in elderly patients with Parkinson's disease

After adjusting the covariates, disease acceptance had a partial mediating effect between community self-efficacy and social isolation. The Bootstrap test was further used to test the mediating effect. The results of the Bootstrap test showed that the total effect (0.305, 0.580), the direct effect (0.217, 0.525), mediation effect (0.001, 0.160), and its 95% confidence interval does not contain 0, indicating that community self-efficacy can directly predict social isolation, and can also predict social isolation through the mediating effect of disease acceptance. In this study, disease acceptance had a partial mediating effect on community self-efficacy and social isolation, and the effect values of its direct effect and mediating effect accounted for 83.9% and 16.1% of the total effect value, respectively. The results are shown in Table 5 and Figure2.

Table 5 Test of the mediating effect of disease acceptance on the relationship between community self-efficacy and social isolation in elderly PD patients

Influence path	Effect size	Boot SE	Boot LLCI	Boot ULCI	Effect size
Total effect	0.442	0.070	0.305	0.580	100%
Direct effect	0.371	0.078	0.217	0.525	83.9%
Mediation effect	0.071	0.040	0.001	0.160	16.1%

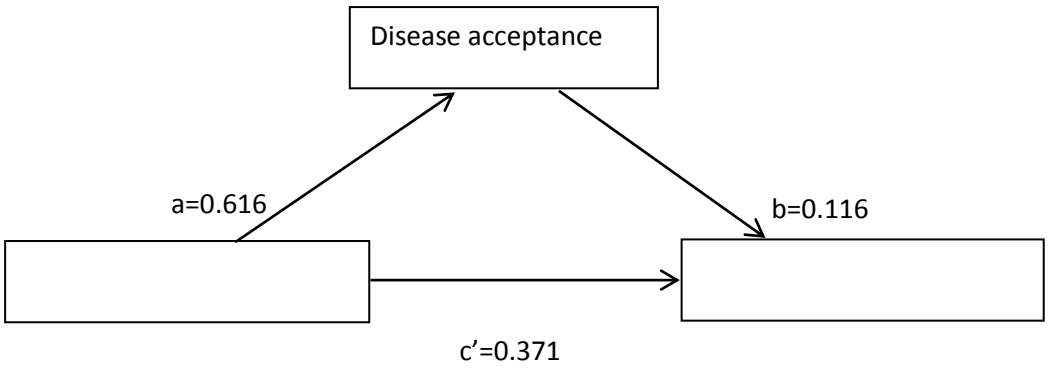

Figure 2 The path coefficient diagram of the structural equation model for the relationship between community self-efficacy, disease acceptance, and social isolation

4. Discussion

4.1 Analysis of the Status quo of self-efficacy, Social Isolation and Disease acceptance in Elderly Parkinson's Patients

The results of this study show that the mean score of the community self-efficacy scale is (11.03±6.21), which is slightly lower than that of Wang Xiaoyan et al. (Wang Xiaoyan, Yang Hongjuan, & Gao Zhenbang, 2009). At the same time, the average value of this score is 13 points lower than the median, which means that the community self-efficacy is generally low. Studies have shown that community self-efficacy is an important factor in predicting health behavior changes in patients with chronic diseases (Guo Limin et al., 2021). Patients with stronger community self-efficacy have stronger life beliefs and better disease self-management. In this study, 33.0% of elderly PD patients had social isolation, and the incidence of friend isolation was higher than that of family isolation, which was consistent with the research results of Zhang Wenjuan et al., friends of the same age in elderly PD patients are also gradually decreasing; at the same time, physical fitness and physical activity function are also gradually declining (An Yan, 2021) (Zhao Di, 2021), which to a certain extent limits the communication between elderly Parkinson's patients and friends, increasing its isolation risk. This study found that the disease acceptance score of elderly PD patients was (23.56±6.871), and the overall disease acceptance was moderate. At present, there is little literature on the disease acceptance of PD patients at home and abroad. The reason for the moderate disease acceptance of PD patients may be related to the characteristics of the disease itself. PD is a chronic progressive disease, and most of the patients investigated are still in the stage of mild disease severity, and the symptoms of the disease have not yet greatly affected their lives. Therefore, in this study, the overall disease acceptance of elderly PD patients was moderate.

4.2 Correlation analysis of community self-efficacy, social isolation, and disease acceptance in elderly patients with Parkinson's disease

The results of this study showed that community self-efficacy was significantly correlated with social isolation and disease acceptance ($P<0.01$). Community self-efficacy was negatively correlated with social isolation. There is no report on the correlation between the two in elderly PD patients in China, but foreign studies have shown that self-efficacy can predict the change and maintenance of healthy behaviors and play a key role in individual behavior changes (JA, M, & C, 2005), consistent with the results of this study. Studies have shown that patients with high community self-efficacy have stronger confidence in fighting the disease, can effectively cope with negative emotions such as depression and anxiety, can actively understand the knowledge about the disease and actively participate in the self-management of the disease (Lu Fang, Yin Anchun, & Zhang Tingting, 2015); and then provide a physical basis for better building personal social networks and reduce social isolation. Elderly PD patients with low self-efficacy are very likely to doubt their abilities, produce strong stress reactions such as anxiety, and passively respond to the environment with various defensive withdrawal behaviors (Zhou Xiaoli,

2014), and then social isolation occurs. The community self-efficacy of elderly PD patients is positively correlated with disease acceptance, which is consistent with the research results of Guo Yafen (Guo Yafen, 2021). The more positive the patient's cognition of the disease, the higher the acceptance of the disease (Chai Qianwen, Yuan Zhifang, Jin Yi, & Zhang Qing, 2016). Elderly PD patients with high community self-efficacy are more confident in life and more confident about the disease. The cognition of PD patients is relatively positive. Studies have shown that reducing or stopping drugs without authorization during the treatment of PD patients can easily induce Parkinson's hyperthermia syndrome, which will be life-threatening if not treated in time (Harada et al., 2003), community self Elderly PD patients with a high sense of efficacy will better self-manage their disease after recognizing the necessity of treatment, so they have a high degree of disease acceptance. Patients with higher disease acceptance have higher treatment compliance (Liu Feng, Wang Qian, & Chen Bo, 2022), and PD patients with higher disease acceptance can better control their disease; at the same time, patients with higher disease acceptance, more positively the ability to regulate the body and mind can be maintained, the negative emotions caused by the disease can be reduced (Guo Yafen, 2021); the control of the disease provides a good physical foundation for elderly PD patients to go out and socialize,

And the reduction of negative emotions provides a good foundation for their social interaction. The psychological basis helps patients to expand their social network and reduce social isolation.

4.3 Analysis of the mediating effect of disease acceptance on community self-efficacy and social isolation

In this study, the mediation effect results of the traditional model show that there is no mediation effect between community self-efficacy and social isolation for disease acceptance. This study further controls the covariates to explore the relationship between the three. Illness acceptance has a partial mediating effect on community self-efficacy and social isolation. Community self-efficacy is an important predictor of social isolation, and it can still significantly predict social isolation when the mediator variable of disease acceptance is added. That is, disease acceptance is an important factor in the influence of community self-efficacy on social isolation. Elderly PD patients with high community self-efficacy have higher disease acceptance. Patients with high community self-efficacy have higher self-evaluation, higher executive power, and higher persistence in dealing with things (Zhang Chunyan, Li Qin, Wang Qian, & Gu Pingping, 2020). Such as elderly PD patients firmly believe that they can overcome the disease, and actively control their disease by establishing good living behaviors and improving treatment compliance. Their treatment enthusiasm is higher and their disease acceptance is higher. Patients with higher disease acceptance are more able to adapt to the restrictions brought by the disease and reduce the impact of the disease on life (Beata, Natalia, Edyta, Aneta, & Mariusz, 2020); at the same time, such patients treat the disease with an optimistic attitude, actively After receiving treatment (Chiang, Livneh, Guo, Yen, & Tsai, 2015), the disease is better controlled, and it provides patients with better psychological conditions and physical fitness for social activities, which helps them expand their social scope and reduce social isolation. Conversely, community self-efficacy, as a psychological dynamic factor, can affect patients' emotional responses and coping attitudes when coping with illness (Iwanowicz-Palus, Zarajczyk, Pięta, & Bień, 2019), and patients with low community self-efficacy are not willing to Actively understand their diseases, and will not take active coping methods in the face of the threats brought by the diseases, so their disease acceptance is relatively low. Patients with low disease acceptance will underestimate their mobility and are unwilling to follow orders (Hornik & Duława, 2019), which will lead to aggravation of the disease, decreased physical activity, etc.; unable to participate in social activities and carry out social activities, the higher the incidence of social isolation.

5. Conclusion

To sum up, there is a correlation between community disease acceptance, self-efficacy, and social isolation in elderly PD patients, and disease acceptance has a partial mediating effect on community self-efficacy and social isolation. Therefore, we need to improve the community self-efficacy of patients, strengthen the community network of patients, and promote the creation of a good neighborhood atmosphere for patients; at the same time, we should also pay attention to improving the disease acceptance of patients, helping patients reduce the incidence of social isolation, to improve patients' health and quality of Life.

Supplementary Information

Author Contributions

Conceptualization, Y.-R.W. and Y.-W.F.; formal analysis, S.-M. C and Y.-W.F.; investigation, G.Y.; methodology, Y.-R.W., and M.S.; writing original draft preparation. Y.-W.F. and Y.-RW.; writing-review and editing, Y.-W.F., J. C., and S.-M.C. All authors have read and agreed to the published version of the manuscript.

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Declaration

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data that support the findings of this study are available from the first author.

Conflicts of Interest: The author(s) declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

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