

## Original Article

# High-quality nursing intervention can improve negative emotions, quality of life and activity of daily living of elderly patients with Parkinson's disease

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**Abstract:** Objective: This study was designed to determine the effect of high-quality nursing intervention on negative emotions, quality of life and activities of daily living (ADL) of elderly patients with Parkinson's disease (PD). Methods: Totally 115 elderly PD patients treated in our hospital from March 2018 to September 2019 were selected as the research participants. According to different nursing intervention methods, they were divided into two groups. The research group (RG) (65 cases) received high-quality nursing intervention, while the control group (CG) (50 cases) received routine nursing intervention. The adverse reactions, negative emotions, quality of life, ADL, PSQI, MDRSPD scores and nursing satisfaction were compared between the two groups. Results: After nursing intervention, the incidence of adverse reactions in the RG was dramatically lower than that in the CG. Before nursing intervention, there was no marked difference in the scores of quality of life, ADL and MDRSPD between the two groups. But after nursing, those scores in the RG were markedly higher than those in the CG. Before nursing intervention, there was no remarkable difference in SAS, SDS and PSQI scores between both groups, but after that, the scores of the RG were obviously lower than those of the CG. After nursing intervention, the nursing satisfaction of patients in the RG was dramatically higher than that in the CG. Conclusion: High-quality nursing intervention for elderly PD patients can dramatically improve their negative emotions, quality of life and ADL, and promote recovery of motor function.

**Keywords:** High-quality nursing, elderly patients, Parkinson's disease, negative emotions, quality of life, activities of daily living

## Introduction

Parkinson's disease (PD) is a neurodegenerative disease, which is mainly characterized by progressive degeneration of dopamine neurons in substantia nigra of midbrain, involving multiple systems and progressing slowly, and is common in middle-aged and elderly people [1, 2]. The prevalence rate of PD is about 0.3%, the average age of onset is about 60 years old, the prevalence rate gradually increases with the increase of age, and the male is slightly higher than the female [3, 4]. At the moment, the etiology of PD is vague, which may be related to age, environment and genes, and 10-15% of patients suffer from genetic diseases [5, 6]. The typical symptoms of PD are motor symptoms, including progressive bradykinesia, static tremor, myotonia and postural gait disorder, etc. Meanwhile, PD also has non-motor symptoms such as cognitive and sleep disorder, anx-

ety and depression, pain and fatigue, etc. [7]. Diagnosing PD mainly depends on medical history, clinical symptoms and signs through routine examination of blood cerebrospinal fluid in laboratory and CT and MRI examination of brain [8]. The PD treatment adopts comprehensive intervention, with drug treatment as the first choice and surgery as a supplement [9, 10]. However, the treatment period of this disease is long, and patients are prone to negative psychological emotions such as anxiety and depression, which seriously affect the treatment effect and their quality of life [11-13]. Therefore, it is vital for patients to find an effective and safe nursing intervention while receiving treatment clinically.

High-quality nursing is a patient-centered nursing service. It integrates the concept of humanistic care into nursing and combines patients' needs and disease characteristics, providing

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them with personalized high-quality nursing services, making nursing more humane and meeting their needs. At the same time, it also has higher requirements for nursing staff, which can improve their own professional ethics and professionalism, thus improving the quality of nursing services as a whole [14, 15]. With the development of modern social psychological biomedical model, the traditional nursing model which only considers the disease itself and separates from patients' social psychological factors has been subverted, and the emergence of more and more new nursing intervention models makes the clinical nursing effect more obvious [16, 17]. Research has shown that the application of high-quality nursing in pregnant women during the delivery can markedly improve maternal postpartum depression and other adverse psychological emotions, reduce postpartum complications, and increase neonatal scores [18]. However, there have been few studies on the application of high-quality nursing in elderly PD patients.

We carried out high-quality nursing intervention for elderly PD patients, to explore its influence on their negative emotions, quality of life and activities of daily living (ADL), and to provide them with a feasible nursing intervention scheme.

### Materials and methods

#### General data

A total of 115 elderly PD patients treated in Taizhou Second People's Hospital from March 2018 to September 2019 were selected as the research participants. Based on different nursing intervention methods, they were divided into two groups. The research group (RG) (65 cases) received high-quality nursing intervention, while the control group (CG) (50 cases) received routine nursing intervention. In the RG, there were 37 males and 28 females with an average age of  $67.82 \pm 2.14$  years, ranging from 60 to 72 years. In the CG, there were 30 males and 20 females, with an average age of  $68.02 \pm 2.35$  years, ranging from 61 to 75 years.

#### Inclusion and exclusion criteria

*Inclusion criteria:* (1) All patients met the diagnostic criteria of PD [19]; (2) Patients had complete clinical data; (3) This study was approved

by the ethics committee of our hospital. All patients and their families have been informed, and they signed a full informed consent form.

*Exclusion criteria:* (1) Patients complicated with terminal diseases such as malignant tumors; (2) Patients complicated with severe organic diseases of heart, liver or kidney; (3) Patients complicated with cognitive, language and hearing impairment; (4) Patients complicated with mental illness or family history of mental illness; (5) Those who withdrew from the research halfway.

#### Nursing methods

Patients in the CG were given routine nursing intervention mode, including basic and hospital nursing, routine examination, medication guidance, disease monitoring, ward environmental nursing, reasonable diet guidance, morning and evening nursing, rehabilitation guidance and other routine nursing.

Patients in the RG implemented the high-quality nursing intervention model on the basis of the CG. The specific measures were as follows:

A professional high-quality nursing team was established: All members of the team received unified training and passed the examination before entering the group. The members included professional chief doctors of PD and nurses with rich experience in specialized nursing. In view of the responsibility system to individuals, a professional nursing team was formed, and a responsibility system nursing model was established.

A high-quality health knowledge education was provided: In the light of the condition and actual situation of patients, targeted health education manuals were formulated. Patients were guided to learn and familiarize with the education contents, and their awareness of hospital environment, examination items, treatment methods and drug use methods were improved. Before patients were discharged from the hospital, they were publicized and educated, and follow-up work was done after they were discharged.

A high-quality psychological nursing was provided: The responsible nurses strengthened communication with patients, established a

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good doctor-patient relationship, timely and dynamically understood their psychological status, and gave them targeted psychological counseling and education. According to the actual condition of patients, the bad psychological and emotional problems were alleviated by playing music, videos and conducting psychological lectures. The team members used nonverbal communication methods such as shaking hands, touching and hugging to enhance patients' safety and trust. They also made use of peer education to introduce patients' experience of curing and improving disease resistance, and help them build confidence in overcoming diseases. If the condition of patients permitted, they were encouraged to actively participate in some recreational activities organized in the hospital. Simultaneously, the nursing staff used positive language and optimistic attitude to infect and motivate patients, and organized regular exchange meetings for successful patients, so as to convey positive and optimistic treatment ideas, improve treatment confidence, eliminate bad emotions and relieve psychological pressure.

A high-quality medication guidance was provided: Patients were instructed to take regular medication according to the doctors' advice, informed of the role of medication and the importance of taking medication step by step for a long time, thus improving their medication compliance. In the meantime, patients were informed of the possible effects of taking certain drugs on the disease itself and treatment medication, so as to improve the efficacy; besides, they were told to take medicine before or 1 h after meals, so as to improve the utilization rate and curative effect of drugs.

A comprehensive diet guidance was provided: The nurses made individualized diet plans for patients and adjusted them according to their specific conditions. The patients were asked to eat more fruits and vegetables, cereals, and drink enough water to ensure smooth stool. And they were asked to keep a small number of meals, avoid overheating or cold food, eat and drink with a proper sitting posture, and pay attention to rhythm.

A comprehensive rehabilitation nursing was provided: The nursing staff guided and assisted the patients in limb function rehabilitation exercise, from passive to active exercise, and kept

the movement slow and gentle. They instructed patients to massage and relax muscles first, and then move joints, from small to large joints, from distal to proximal ends, to avoid joint stiffness and limb contracture, and keep exercising for 30-60 min every day, gradually increasing exercise intensity and time, improving training effect and ADL.

A high-quality behavioral intervention nursing was provided: The nursing staff guided patients' lifestyle, instructed them to have good sleep habits and taught them how to relax their muscles, so as to improve their sleep and reduce tension. When necessary, suggestive therapy was used instead of sleeping drugs.

A comprehensive family social support guidance was provided: The nurses encouraged patients' families to visit frequently, and for those with daily life dysfunction, guided family members to accompany them, provide emotional support and care, and give positive psychological suggestion. Concurrently, patients were encouraged to take part in proper family work accompanied by their families, master certain rehabilitation training methods and participate in activities organized by community activity centers.

### *Outcome measures*

*Main outcome measures:* (1) The psychological status of patients in both groups was observed: The anxiety and depression status before and after nursing intervention were evaluated with Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS) [20]. The total score of SAS scale was 100 points. And, scores of 50-70 indicated mild anxiety, 71-90 indicated moderate anxiety, and > 90 indicated severe anxiety. The higher the score was, the more serious the anxiety was. The total score of SDS scale was 100 points. And, scores of 50-70 indicated mild depression, 71-90 indicated moderate depression, and > 90 indicated severe depression. The higher the score, the more severe the depression was. (2) The quality of life of patients in the two groups was observed: The quality of life of patients after nursing intervention was evaluated with SF-36 scale [21]. The scale includes eight items: general health, physiological function, physical pain, vitality, social function, emotional function and mental health. Each item has a score

of 0-100. The higher the score, the better the quality of life was. (3) The ADL scores of patients in the two groups were observed: The ADL of patients before and after treatment was evaluated by Barthel index score scale [22]. The scale includes 10 items, such as defecation, urination, decoration, toilet use, eating, transfer, activity, dressing, going up and down stairs, and bathing. It is divided into 4 grades, 15, 10, 5, and 0, with a full score of 100. One hundred points indicated that the ability of daily life and activities was good, without the help of others; 61-99 points indicated mild dysfunction, able to complete daily activities independently, but needed some help; 41-60 indicated moderate dysfunction, but needed great help to complete daily life activities; 21-40 indicated severe dysfunction, and most of the daily life activities could not be completed; 0-20 indicated a very serious functional defect, and life needed to depend on other completely. The higher the score, the stronger the ADL was. (4) MDRSPD scores: the content of MDRSPD scale [23] includes sitting up, walking posture, writing, manual dexterity, speaking speed and fluency, with a total score of 60 points. The higher the score, the better the functional recovery was.

*Secondary outcome measures:* (1) The incidence of adverse reactions was observed. (2) The sleep quality of patients in the two groups were observed: The sleep quality of patients was evaluated by Pittsburgh Sleep Quality Index (PSQI) [24]. There are 7 components and 18 items in the scale, and each component is scored based on 0-3. The cumulative score is the total score of PSQI, and the total score ranges from 0-21. 0-5 points indicated that the sleep quality was very good; 6-10 indicated that it was OK; 11-15 indicated that it was average; 16-21 indicated that it was poor. (3) The nursing satisfaction of patients in the two groups were observed: The nursing satisfaction of patients after nursing intervention were assessed by using the nursing satisfaction questionnaire made by our hospital. There are 20 questions in the scoring content, and patients were scored based on the nursing content of our hospital. Each question has 5 points, with the total score of <70 as dissatisfied, 70-89 as satisfied, and  $\geq 90$  as very satisfied. Satisfaction = (very satisfied+satisfied)/total cases  $\times 100\%$ .

### *Statistical methods*

All data were statistically analyzed by SPSS24.0 (IBM Corp, Armonk, NY, USA), and the pictures were drawn by GraphPad Prism 7. The counting data were expressed by [n (%)] and the inter-group comparison was assessed by Chi-square test. When the theoretical frequency was less than 5, continuity correction Chi-square test was employed. The measurement data were expressed by mean  $\pm$  standard deviation ( $\bar{x} \pm sd$ ), the inter-group comparison was analyzed by independent-samples t test, and the intra-group comparison was made by paired-t test.  $P < 0.05$  indicated that the difference was statistically significant.

### **Results**

#### *General data*

There was no marked difference in general clinical baseline data such as gender, age, body mass index (BMI), course of disease, marriage, place of residence, nationality, educational background, and history of smoking, drinking, hypertension and diabetes between the two groups ( $P > 0.05$ ) (**Table 1**).

#### *Comparison of incidence of adverse reactions between the two groups*

After nursing intervention, the incidence of adverse reactions in the RG was 9.23%, which was obviously lower than that in the CG ( $P < 0.05$ ) (**Table 2**).

#### *Comparison of SAS and SDS scores between the two groups*

Before nursing intervention, there was no marked difference in SAS and SDS scores between the two groups ( $P > 0.05$ ). After that, the scores decreased markedly, and they were obviously lower in the RG than those in the CG ( $P < 0.001$ ) (**Figure 1**).

#### *Comparison of quality of life scores between the two groups*

After nursing intervention, the scores of quality of life in general health, physiological function, physical pain, vitality, social function, emotional function and mental health in the RG were obviously higher than those in the CG ( $P < 0.001$ ) (**Figure 2**).

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**Table 1.** Comparison of general data between the two groups [n (%)] ( $\bar{x} \pm sd$ )

Classification	Research group (n=65)	Control group (n=50)	t/ $\chi^2$ value	P value
Gender			0.110	0.740
Male	37 (56.92)	30 (60.00)		
Female	28 (43.08)	20 (40.00)		
Age (years)	67.82±2.14	68.02±2.35	0.476	0.635
BMI (kg/m <sup>2</sup> )	23.07±3.12	23.21±3.02	0.241	0.809
Course of disease (years)	5.12±1.54	5.42±1.60	1.018	0.310
Marriage			1.076	0.299
Married	51 (78.46)	43 (86.00)		
Unmarried	14 (21.54)	7 (14.00)		
Place of residence			0.766	0.381
Cities and towns	46 (70.77)	39 (78.00)		
Countryside	19 (29.23)	11 (22.00)		
Nationality			1.270	0.259
Han	49 (75.38)	42 (84.00)		
Ethnic minorities	16 (24.62)	8 (16.00)		
Education background			1.017	0.313
≥ high school	41 (63.08)	36 (72.00)		
< high school	24 (36.92)	14 (28.00)		
History of smoking			0.199	0.654
Yes	18 (27.69)	12 (24.00)		
No	47 (72.31)	38 (76.00)		
History of drinking			0.314	0.575
Yes	20 (30.77)	13 (26.00)		
No	45 (69.23)	37 (74.00)		
History of hypertension			0.191	0.661
Yes	22 (33.85)	15 (30.00)		
No	43 (66.15)	35 (70.00)		
History of diabetes			0.344	0.557
Yes	16 (24.62)	10 (20.00)		
No	49 (75.38)	40 (80.00)		

### Comparison of ADL scores of patients between the two groups

Before nursing intervention, there was no marked difference in ADL scores between the two groups ( $P > 0.05$ ). After that, the scores increased markedly, and the scores of patients in the RG were obviously higher than those in the CG ( $P < 0.001$ ) (**Figure 3**).

### Comparison of sleep quality scores of patients between the two groups

Before nursing intervention, there was no remarkable difference in PSQI scores between the two groups ( $P > 0.05$ ). Afterwards, the

scores decreased markedly, and they were markedly lower in the research group than those in the control group ( $P < 0.001$ ) (**Figure 4**).

### Comparison of MDRSPD scores between the two groups

Before nursing intervention, there was no marked difference in the MDRSPD scores between the two groups ( $P > 0.05$ ). After nursing intervention, the scores increased, and they were higher in the RG than those in the CG ( $P < 0.001$ ) (**Figure 5**).

### Comparison of nursing satisfaction of patients between the two groups

After nursing intervention, the nursing satisfaction of the RG was 93.85%, while that of the CG was 70.00%. The nursing satisfaction of the patients in the RG was obviously higher than that in the CG (**Table 3**).

## Discussion

PD is a common chronic progressive nervous system degenerative disease [25]. The etiology and pathogenesis are vague, so there is no complete cure in clinical practice [26]. The course of the disease develops slowly and continuously, showing an increasing

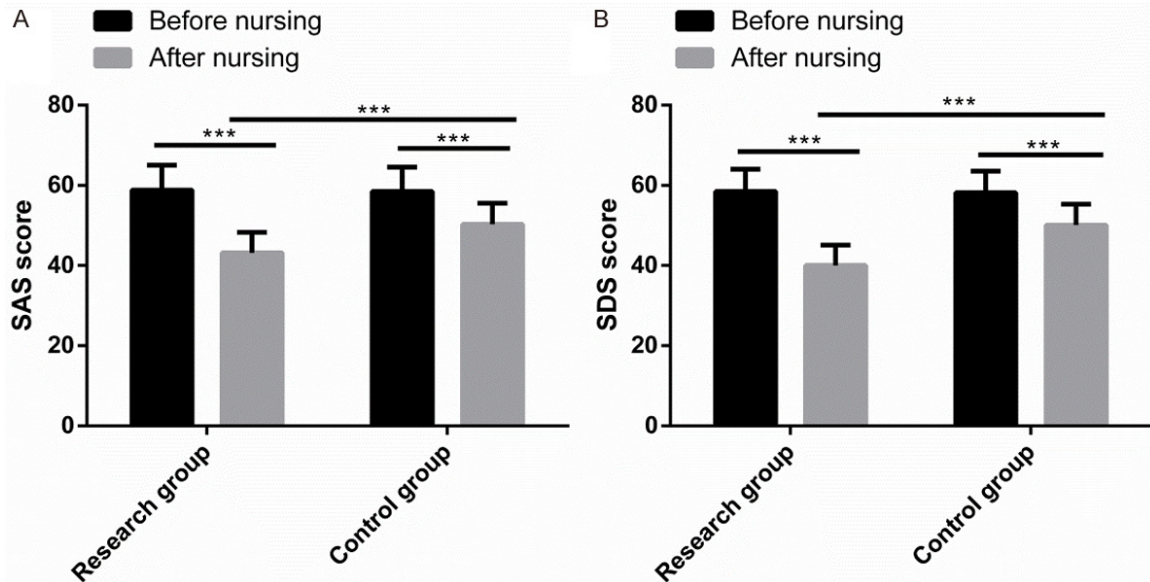
trend year by year. Eventually, patients have difficulty in behavior due to rigidity of the whole body, and the disability rate is high, which seriously endangers the physical and mental health of the middle-aged and elderly people and reduces their quality of life [27, 28]. Thus, it is vital to give active and effective high-quality nursing intervention to PD patients on the basis of drug treatment [29].

High-quality nursing intervention is a comprehensive and systematic intervention mode, and the starting point of all practice is patient-centered. Nursing intervention is carried out from patients' physiological and psychological aspects, and the effect of clinical nursing inter-

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**Table 2.** Comparison of incidence of adverse reactions between the two groups [n (%)]

Group	Gastrointestinal reaction	Dizziness, headache	Insomnia	Total incidence
Control group (n=50)	5 (10.00)	6 (12.00)	4 (8.00)	15 (30.00)
Research group (n=65)	2 (3.08)	1 (1.54)	3 (4.61)	6 (9.23)
$\chi^2$	-	-	-	8.167
P	-	-	-	0.004

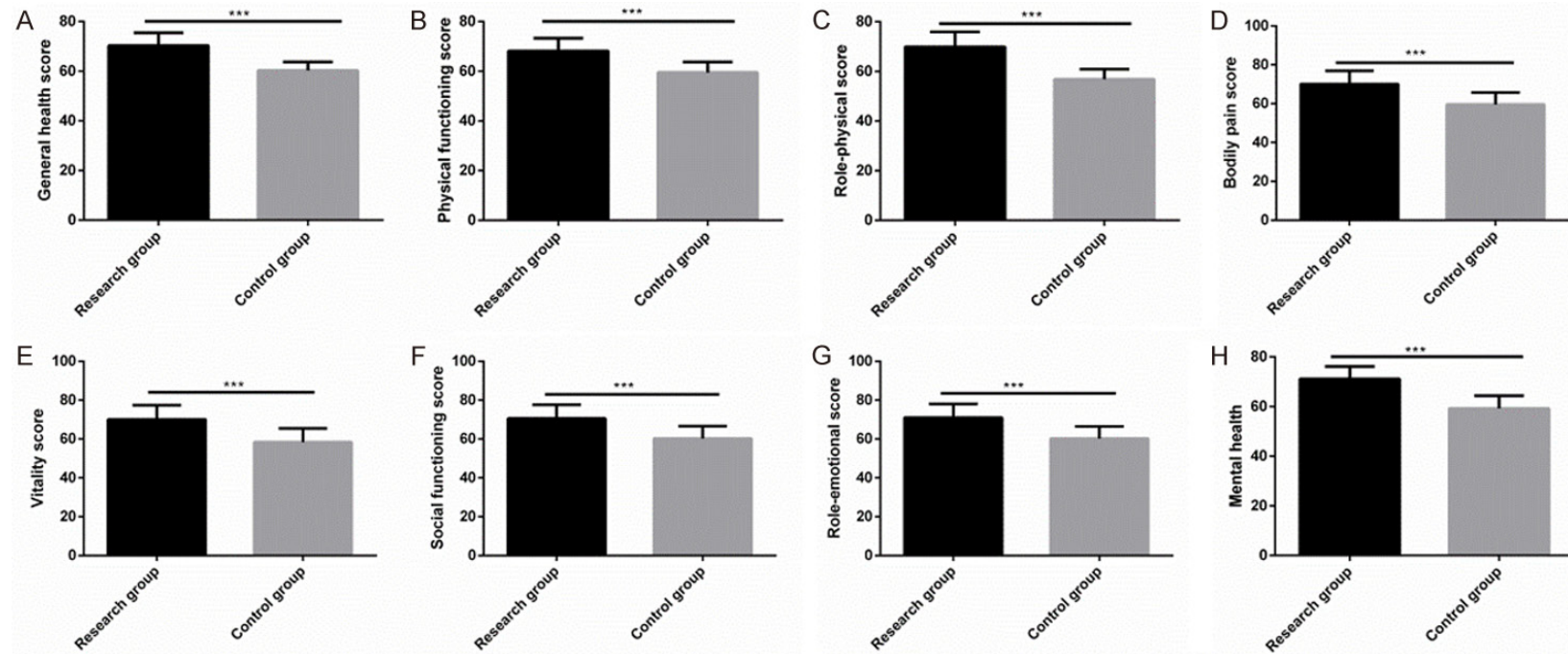


**Figure 1.** Comparison of SAS and SDS scores between patients of the two groups. A. After nursing intervention, the SAS scores of patients in the two groups decrease dramatically, and patients in the research group are markedly lower than those in the control group. B. After nursing intervention, the SDS scores of patients in the two groups decrease obviously, and patients in the research group are markedly lower than those in the control group. Note: \*\*\*P<0.001.

vention is remarkable [30, 31]. In this study, we carried out high-quality nursing intervention for elderly PD patients and explored its clinical application effect. The results manifested that after nursing intervention, the incidence of adverse reactions in the RG was obviously lower than that in the CG, suggesting that comprehensive measures of high-quality nursing intervention could obviously reduce the adverse reactions in the treatment process and improve the clinical efficacy. What's more, the SAS and SDS scores of patients in the RG were markedly lower than those in the CG, suggesting that high-quality nursing intervention could dramatically improve patients' negative emotions such as anxiety and depression. We have adopted comprehensive psychological nursing intervention measures, which can timely discover, guide and solve negative psychological problems in treatment, so that patients can adjust to an optimal psychological state during

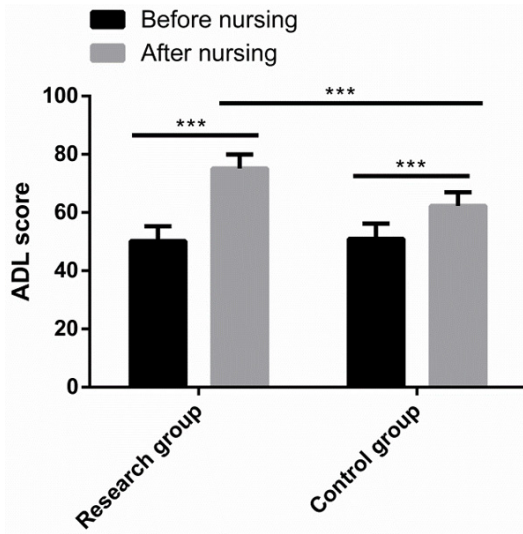
treatment and clinical efficacy can be improved. Gibson *et al.* [32] found that the nursing intervention model of social psychology method could bring more benefits to PD patients and improve their negative psychological emotions and quality of life, which was similar to our research results. Zhang *et al.* [33] clarified that cognitive behavioral intervention therapy for PD patients could dramatically improve their anxiety and depression, which was consistent with our research results. It was found that after nursing intervention, the scores of patients' quality of life in the RG were obviously higher than those in the CG, suggesting that high-quality nursing intervention could better improve their quality of life. A series of measures, such as high-quality health knowledge education, the best nursing quality and service attitude, the most comprehensive life guidance, medication and diet plan, are taken from the perspective of modern social psychological model, tak-

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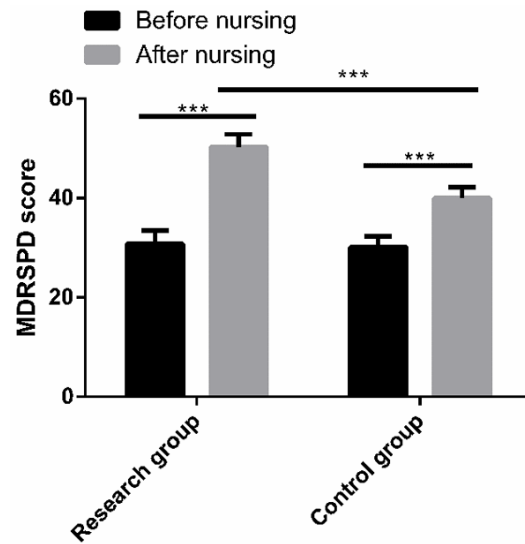


**Figure 2.** Comparison of quality of life of patients between the two groups. A. The overall health score of the research group is significantly higher than that of the control group. B. The physiological function score of the research group is dramatically higher than that of the control group. C. The physiological function score of the research group is significantly higher than that of the control group. D. The score of physical pain in the research group is dramatically higher than that in the control group. E. The life vitality score of the research group is significantly higher than that of the control group. F. The social function score of the research group is dramatically higher than that of the control group. G. The emotional function score of the research group is significantly higher than that of the control group. H. The mental health score of the research group is dramatically higher than that of the control group. Note: \*\*\* $P < 0.001$ .

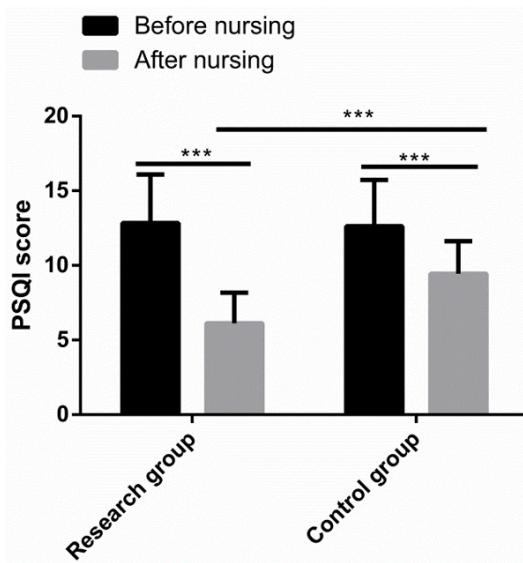
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**Figure 3.** Comparison of ADL scores of patients between the two groups. After the nursing intervention, the ADL scores of patients in the two groups increase significantly, and the scores in the research group are obviously higher than those in the control group. Note: \*\*\* $P < 0.001$ .



**Figure 5.** Comparison of MDRSPD scores between the two groups. After nursing intervention, the MDRSPD scores of the two groups increase, and the score in research group is higher than that in the control group. Note: \*\*\* $P < 0.001$ .



**Figure 4.** Comparison of PSQI scores of patients between the two groups. After nursing intervention, the PSQI scores of patients in the two groups decrease markedly, and the scores in the research group are obviously lower than those in the control group. Note: \*\*\* $P < 0.001$ .

ing into account the physiological and psychological factors of patients comprehensively, thus greatly improving the quality of life. Navarta-Sanchez *et al.* [34] pointed out that multidisciplinary psychological education inter-

vention for PD patients could dramatically improve their quality of life and reduce their economic burden, similar to our research results. This study found that after nursing intervention, the ADL scores of patients in the RG were markedly higher than those in the CG, which suggested that high-quality nursing intervention could markedly improve the ADL. Comprehensive rehabilitation training and behavioral intervention guidance and family members' support can significantly improve patients' behavior habits and rehabilitation effect, thus improving their ADL. Pretzer-Aboff *et al.* [35] discovered that the function-centered nursing intervention model for PD patients could dramatically strengthen and improve their ADL and improve the outcome of their motor function, similar to our research results. Sleep disorder is a non-motor symptom of PD, which can affect patients' quality of life to a certain extent and reflect their condition. Pittsburgh Sleep Quality Index (PSQI) is a familiar tool to evaluate their sleep quality [36, 37]. We evaluated patients' sleep disorder, and found that the PSQI scores of patients in the RG were dramatically lower than those in the CG after nursing intervention, which indicated that high-quality nursing intervention could better alleviate their sleep disorder. Gregory *et al.* [38] found that the nursing intervention on the



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**Table 3.** Comparison of nursing satisfaction of patients between the two groups [n (%)]

Items	Research group (n=65)	Control group (n=50)	$\chi^2$ value	P value
Very satisfied	48 (73.85)	14 (28.00)	-	-
Satisfaction	13 (21.43)	21 (42.00)	-	-
Dissatisfied	4 (20.00)	15 (30.00)	-	-
Nursing satisfaction	61 (93.85)	35 (70.00)	11.650	0.0006

health education skills of sleep and insomnia for PD patients could markedly improve their sleep disorders and quality, which was similar to our high-quality nursing intervention measures and research results. Zhang *et al.* [39] found that music exercise therapy could improve the motor dysfunction and cognitive function of PD patients. In this study, we found that the MDRSPD score of the RG was higher than that of the CG, indicating that the motor function of patients recovered better after high-quality nursing intervention, which was similar to the results of Zhang *et al.* Finally, we investigated the nursing satisfaction of patients, and found that the satisfaction of patients in the RG was obviously higher than that in the CG, which also showed that high-quality nursing was more acceptable and patients were more willing to accept it.

The innovation of this study lies in the use of a series of new measures of high-quality nursing, all of which are patient-centered, focusing on the nursing model aimed at improving patients' ADL, quality of life and motor function. Although this study confirmed that high-quality nursing intervention could bring more benefits to the elderly PD patients, there is still room for improvement. For example, we can further track the long-term treatment effect of the follow-up patients, and expand the sample size to improve the credibility of the study. In the future, we will gradually conduct supplementary research from the above perspectives.

To sum up, giving high-quality nursing intervention to elderly PD patients can improve their negative emotions such as anxiety and depression, enhance their quality of life and ADL, reduce the incidence of adverse reactions, and better their sleep quality and nursing satisfaction.

### Disclosure of conflict of interest

None.

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### References

- [1] Blauwendraat C, Nalls MA and Singleton AB. The genetic architecture of Parkinson's disease. *Lancet Neurol* 2020; 19: 170-178.
- [2] Shetty AS, Bhatia KP and Lang AE. Dystonia and Parkinson's disease: what is the relationship? *Neurobiol Dis* 2019; 132: 104462.
- [3] Simon DK, Tanner CM and Brundin P. Parkinson disease epidemiology, pathology, genetics, and pathophysiology. *Clin Geriatr Med* 2020; 36: 1-12.
- [4] Chatterjee D and Kordower JH. Immunotherapy in Parkinson's disease: current status and future directions. *Neurobiol Dis* 2019; 132: 104587.
- [5] Dube U, Ibanez L, Budde JP, Benitez BA, Davis AA, Harari O, Iles MM, Law MH, Brown KM, andMe Research T, Melanoma-Meta-analysis C and Cruchaga C. Overlapping genetic architecture between Parkinson disease and melanoma. *Acta Neuropathol* 2020; 139: 347-364.
- [6] Hernandez DG, Reed X and Singleton AB. Genetics in Parkinson disease: mendelian versus non-Mendelian inheritance. *J Neurochem* 2016; 139 Suppl 1: 59-74.
- [7] Hughes KC, Gao X, Molsberry S, Valeri L, Schwarzschild MA and Ascherio A. Physical activity and prodromal features of Parkinson disease. *Neurology* 2019; 93: e2157-e2169.
- [8] Armstrong MJ and Okun MS. Diagnosis and treatment of Parkinson disease: a review. *JAMA* 2020; 323: 548-560.
- [9] Huang J, Hong W, Yang Z, Ding J and Ren Y. Efficacy of pramipexole combined with levodopa for Parkinson's disease treatment and their effects on QOL and serum TNF-alpha levels. *J Int Med Res* 2020; 48: 300060520922449.
- [10] Connolly BS and Lang AE. Pharmacological treatment of Parkinson disease: a review. *JAMA* 2014; 311: 1670-1683.
- [11] Mitchell KT and Ostrem JL. Surgical treatment of Parkinson disease. *Neurol Clin* 2020; 38: 293-307.

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- [12] Duker AP and Espay AJ. Surgical treatment of Parkinson disease: past, present, and future. *Neurol Clin* 2013; 31: 799-808.
- [13] Goldman JG and Guerra CM. Treatment of non-motor symptoms associated with Parkinson disease. *Neurol Clin* 2020; 38: 269-292.
- [14] Xiao D, Zheng C, Jindal M, Johnson LB, DeLeire T, Shara N and Al-Refaie WB. Medicaid expansion and disparity reduction in surgical cancer care at high-quality hospitals. *J Am Coll Surg* 2018; 226: 22-29.
- [15] Henry M, Hudson Scholle S and Briefer French J. Accountability for the quality of care provided to people with serious illness. *J Palliat Med* 2018; 21: S68-S73.
- [16] Papadimitriou G. The "biopsychosocial model": 40 years of application in Psychiatry. *Psychiatriki* 2017; 28: 107-110.
- [17] Moore JE, Titler MG, Kane Low L, Dalton VK and Sampsel CM. Transforming patient-centered care: development of the evidence informed decision making through engagement model. *Women Health Issues* 2015; 25: 276-282.
- [18] Symon A, McFadden A, White M, Fraser K and Cummins A. Using a quality care framework to evaluate user and provider experiences of maternity care: a comparative study. *Midwifery* 2019; 73: 17-25.
- [19] Payne K, Walls B and Wojcieszek J. Approach to assessment of parkinson disease with emphasis on genetic testing. *Med Clin North Am* 2019; 103: 1055-1075.
- [20] Dunstan DA, Scott N and Todd AK. Screening for anxiety and depression: reassessing the utility of the Zung scales. *BMC Psychiatry* 2017; 17: 329.
- [21] Lins L and Carvalho FM. SF-36 total score as a single measure of health-related quality of life: scoping review. *SAGE Open Med* 2016; 4: 2050312116671725.
- [22] Ohura T, Hase K, Nakajima Y and Nakayama T. Validity and reliability of a performance evaluation tool based on the modified Barthel index for stroke patients. *BMC Med Res Methodol* 2017; 17: 131.
- [23] Jin X, Wang L, Liu S, Zhu L, Loprinzi PD and Fan X. The impact of mind-body exercises on motor function, depressive symptoms, and quality of life in Parkinson's disease: a systematic review and meta-analysis. *Int J Environ Res Public Health* 2019; 17: 31.
- [24] Manzar MD, BaHammam AS, Hameed UA, Spence DW, Pandi-Perumal SR, Moscovitch A and Streiner DL. Dimensionality of the pittsburgh sleep quality index: a systematic review. *Health Qual Life Outcomes* 2018; 16: 89.
- [25] Isaacson SH. Early recognition and diagnosis of parkinson disease and ongoing assessments. *J Clin Psychiatry* 2019; 81: MS-18003BR1C.
- [26] Shoeibi A, Litvan I, Juncos JL, Bordelon Y, Riley D, Standaert D, Reich SG, Shprecher D, Hall D, Marras C, Kluger B, Olfati N and Jankovic J. Are the International Parkinson disease and Movement Disorder Society progressive supranuclear palsy (IPMDS-PSP) diagnostic criteria accurate enough to differentiate common PSP phenotypes? *Parkinsonism Relat Disord* 2019; 69: 34-39.
- [27] Olanow CW, Factor SA, Espay AJ, Hauser RA, Shill HA, Isaacson S, Pahwa R, Leinonen M, Bhargava P, Sciarappa K, Navia B and Blum D; CTH-300 Study investigators. Apomorphine sublingual film for off episodes in Parkinson's disease: a randomised, double-blind, placebo-controlled phase 3 study. *Lancet Neurol* 2020; 19: 135-144.
- [28] Poewe W and Mahrknecht P. Pharmacologic treatment of motor symptoms associated with Parkinson disease. *Neurol Clin* 2020; 38: 255-267.
- [29] Vacca VM Jr. Parkinson disease: enhance nursing knowledge. *Nursing* 2019; 49: 24-32.
- [30] Murphy F, Doody O, Lyons R, Gallen A, Nolan M, Killeen A, Kavanagh P, Donegan J and Sezgin D. The development of nursing quality care process metrics and indicators for use in older persons care settings: a delphi-consensus study. *J Adv Nurs* 2019; 75: 3471-3484.
- [31] Mackean T, Withall E, Dwyer J and Wilson A. Role of Aboriginal health workers and liaison officers in quality care in the Australian acute care setting: a systematic review. *Aust Health Rev* 2020; 44: 427-433.
- [32] Gibson G. What can the treatment of Parkinson's disease learn from dementia care; applying a bio-psycho-social approach to Parkinson's disease. *Int J Older People Nurs* 2017; 12.
- [33] Zhang Q, Yang X, Song H and Jin Y. Cognitive behavioral therapy for depression and anxiety of Parkinson's disease: a systematic review and meta-analysis. *Complement Ther Clin Pract* 2020; 39: 101111.
- [34] Navarta-Sanchez MV, Ursua ME, Riverol Fernandez M, Ambrosio L, Medina M, Diaz de Cerio S, Alvarez MJ, Senosiain JM, Gorraiz A, Caparros N, Anaut S, Martin-Lanas R, Recio M and Portillo MC. Implementation of a multidisciplinary psychoeducational intervention for Parkinson's disease patients and carers in the community: study protocol. *BMC Fam Pract* 2018; 19: 45.
- [35] Pretzer-Aboff I, Galik E and Resnick B. Feasibility and impact of a function focused care intervention for Parkinson's disease in the community. *Nurs Res* 2011; 60: 276-283.

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- [36] Suzuki K, Okuma Y, Uchiyama T, Miyamoto M, Sakakibara R, Shimo Y, Hattori N, Kuwabara S, Yamamoto T, Kaji Y, Hirano S, Kadowaki T, Hirata K and Kanto Ni. Impact of sleep-related symptoms on clinical motor subtypes and disability in Parkinson's disease: a multicentre cross-sectional study. *J Neurol Neurosurg Psychiatry* 2017; 88: 953-959.
- [37] Zisberg A, Gur-Yaish N and Shochat T. Contribution of routine to sleep quality in community elderly. *Sleep* 2010; 33: 509-514.
- [38] Gregory P, Morgan K and Lynall A. Improving sleep management in people with Parkinson's. *Br J Community Nurs* 2012; 17: 14-18, 20.
- [39] Zhang S, Liu D, Ye D, Li H and Chen F. Can music-based movement therapy improve motor dysfunction in patients with Parkinson's disease? Systematic review and meta-analysis. *Neurol Sci* 2017; 38: 1629-1636.