

## Original Article

# Clinical efficacy of Acupoint moxibustion combined with nutritional intervention in patients with renal failure

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**Abstract:** Objective: The clinical efficacy and quality of life improvement in patients receiving Acupoint moxibustion Nutritional intervention were compared and analyzed to evaluate the effectiveness and feasibility of the combined therapeutic regimen. Methods: We selected 120 patients with kidney failure from July 2020 to February 2024 as the study subjects. According to whether Acupoint moxibustion combined with Nutritional intervention was performed, the patients were divided into the Control group and Observation group with 60 cases respectively. The Control group received Nutritional intervention, while the Observation group received Acupoint moxibustion in addition to Nutritional intervention. The nutritional indexes, Pittsburgh Sleep score (PSQI), lumbar fatigue score, blood glucose and lipid levels were compared between the two groups. Results: The average age, sex, education level, job type, source of medical expenses and primary diseases of the Observation group patients did not change significantly compared with those in the Control group. BUN levels in the Observation group were significantly lower than those in the Control group ( $P$ -value  $<0.001$ ), indicating that the Observation group performed better in renal function measures, especially in urea nitrogen metabolism. Scr levels in the Observation group were also significantly lower than those in the Control group ( $P$ -value  $<0.001$ ). Conclusion: Acupoint moxibustion has a good effect on patients with kidney failure, which can effectively improve blood sugar and lipid levels, sleep quality of patients, lumbar pain and improve patients' nutritional status; therefore, it can be popularized in the rehabilitation management of kidney failure.

**Keywords:** Acupoint moxibustion, kidney failure, sleep quality, lumbar pain, nutritional index

## Introduction

Kidney failure is a serious disease that impairs renal function and causes symptoms like lumbar pain, swelling, and anemia [1]. Current treatments mainly involve medication and dialysis, but long-term results are often unsatisfactory [2]. It is crucial to find safer and more effective treatment options [3].

Acupoint moxibustion is a traditional Chinese therapy that stimulates specific acupoints to treat diseases by regulating qi and blood flow [4, 5]. It is commonly used to relieve symptoms of kidney failure such as lower back pain and muscle weakness by improving kidney blood circulation and reducing kidney burden [6, 7]. Nutritional intervention is mainly focused on adjusting patients' dietary structure and nutri-

ent intake, such as increasing high-quality protein and limiting sodium intake, in response to symptoms such as lower back pain and muscle weakness. These measures help to improve the nutritional status of patients and improve the quality of life.

In recent years, more and more studies have focused on the efficacy of Acupoint moxibustion combined with Nutritional intervention for lower back pain and muscle weakness in patients with kidney failure. A study found that in patients with lower back pain and muscle weakness quality of life can be significantly improved by combining Acupoint moxibustion and Nutritional intervention based on conventional treatment [8]. Another study also showed that this combination treatment can reduce the burden on the kidney and promote the recovery

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of kidney function, thus alleviating symptoms such as lumbar pain [9]. Acupoint moxibustion combined Nutritional intervention has a certain effect on the symptoms of lower back pain and muscle weakness in patients with kidney failure. This comprehensive treatment method has the advantages of traditional Chinese medicine with improved nutrition and it provides patients with a more comprehensive and personalized treatment plan. As medical technology advances, combining Acupoint moxibustion and Nutritional intervention with other treatments can create a comprehensive approach for kidney failure patients. Patient education is also crucial for improving outcomes and quality of life [10].

Kidney failure is a serious common disease, where patients are often accompanied by lower back pain and muscle weakness and other symptoms. In recent years, traditional Chinese medicine Acupoint moxibustion Nutritional intervention, as a comprehensive therapeutic method, has been used more and more in the treatment of patients with kidney failure. Nutritional intervention is a crucial component of the treatment plan for patients with renal failure. This includes adjusting dietary structure to increase high-quality protein intake and limit sodium, potassium, and phosphorus, balancing calorie intake, managing fluid intake, and using nutritional supplements as needed. Regular monitoring and adjustment of the diet are essential to optimize the nutritional status and improve clinical outcomes. We studied the efficacy of Acupoint moxibustion combined Nutritional intervention on lower back pain and muscle weakness in patients with renal failure, aiming to provide reference for clinical practice.

### Materials and methods

#### *Research subjects*

We chose 120 kidney failure patients from July 2020 to February 2024. They were divided into a Control and Observation groups based on whether they received Acupoint moxibustion. Patients met the diagnostic criteria for kidney failure outlined in the Chinese Society of Nephrology's Guidelines for the Diagnosis and Treatment of Endocrine Diseases [11]. Our study passed the ethical approval of Changzhou Traditional Chinese Medicine Hospital and

Changzhou City (Approval Number: 2023-LL-013(L)).

#### *Inclusion and exclusion criteria*

Inclusion criteria: (1) Patients mainly presented with abnormal stool, specifically manifested as constipation or diarrhea, which was significantly different from normal bowel habits. (2) Patients often feel dry mouth and throat, discomfort in the mouth and throat, resulting in dysphagia or increased drinking. (3) Patients generally show symptoms of fatigue, physical strength is significantly reduced, and mental state is not good. Exclusion criteria: (1) Patient with serious complications such as diabetic ketoacidosis, or liver dysfunction. (2) Patient with hematopoietic system diseases. (3) Patient with allergic constitution. (4) Pregnant or lactating women. (5) Patient with severe infection.

#### *Intervention methods*

Patients in the control group underwent a nutritional intervention on the second day of enrollment. The specifics of the intervention included the following: Based on the patient's nutritional risk level, condition, dietary habits, and clinical symptoms, targeted and individualized dietary guidance was formulated. Daily caloric intake was maintained at 30-35 kcal/kg, with protein intake set at 1-1.2 g/kg, prioritizing high-quality protein sources. Salt intake was limited to approximately 2-3 grams per day, and water intake was monitored to avoid excess. To ensure a healthy and balanced diet, it was recommended that patients consume 200-250 grams of staple foods such as rice and noodles daily. Protein intake was set at 1.5 grams per kilogram of body weight, sourced from foods such as beef, fish, chicken, pork, and duck, with an additional recommendation of 40 grams of soy products and 250 milliliters of milk per day. Daily vegetable and fruit intake was set at 300-400 grams, with a preference for low-potassium and low-phosphorus varieties such as cabbage, winter melon, cucumber, bean sprouts, apples, and pears, ensuring a total daily caloric intake of 146.44 kcal/kg. Daily sodium intake was strictly limited to 2-3 grams, and patients were advised to avoid foods such as animal offal, beer, potatoes, bananas, grapefruit, oranges, and tomatoes. Patients were guided on the correct use of measuring tools such as salt

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spoons and oil cups to rationally plan three meals a day. They were encouraged to acquire nutritional knowledge to ensure their daily diet met their body's needs in both quantity and quality. Additionally, patients were instructed to record their dietary intake and participate in weekly dietary surveys. This process aimed to identify and address any unreasonable dietary practices, provide timely guidance, correct bad eating habits, and adjust the dietary plan as needed.

The observation group received acupoint moxibustion in addition to the nutritional intervention. The moxibustion strips used were each 5 cm long to ensure consistent and even burning. We employed high-quality bamboo that had grown for more than six years, carefully crafted for durability and excellent thermal conductivity. The inside of the moxibustion box was lined with high-temperature resistant tin foil to effectively reflect the heat and enhance the moxibustion effect. During moxibustion, the Shen-shu point, located 1.5 inches next to the spinous process of the second lumbar vertebra, was targeted as it is a key point for treatment. Accurate stimulation of this point aims to warm the kidney, assist Yang, strengthen the waist, and fortify the body. Mild moxibustion was applied by placing a lit moxa stick into the moxibustion box, aligning it with the moxibustion site, and maintaining a distance of approximately 2 to 3 cm from the skin. This allowed the patient to feel local warmth without excessive heat. Each moxibustion session lasted about 15 minutes, until the skin flushed, ensuring the treatment was effective while avoiding burns. After moxibustion, patients were advised to stay warm to prevent exposure to cold winds. For optimal results, daily treatments were recommended for seven consecutive days.

### *Research tools*

*Nutritional indicators:* The whole intervention cycle was 4 weeks. Fasting venous blood was collected before and after intervention in both groups, and the peripheral blood total protein (TP), serum albumin (ALB), prealbumin (PA) and hemoglobin (HGB) were detected by multifunctional biochemical analyzer.

*Sleep quality:* The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate the sleep quality of patients in the two groups [12]. PSQI

scale consists of 7 items including sleep time, falling asleep time, sleep quality, daytime dysfunction, sleep disorders, hypnotic drugs and sleep frequency, respectively, each with 0-3 points. The lower the score, the better the sleep quality. Cronbach's coefficient was 0.89, retest reliability coefficient was 0.87, Cronbach's coefficient of each subscale is 0.50-0.83.

### *Lower back pain and muscle weakness score:*

The scoring criteria for lower back pain and muscle weakness are as follows: 0: no symptoms of lumbar or knee weakness. This means that the individual does not feel any tenderness or discomfort in the waist or knees. 1 point: get up in the morning waist sour knee soft, hammering can stop. This means that the individual feels soreness in the waist and knees when they get up in the morning, but this soreness can be relieved by punching or massage. 3 points: persistent lumbar soreness. This means that the individual continues to feel soreness and tenderness in the waist, which is not limited to the morning, may last all day or more, and is not easily relieved by a simple beating or massage. 5 points: unbearable back pain. This is the most severe grade, indicating that the low back soreness felt by the individual is very severe and unbearable, and may have seriously affected the individual's daily life and work. Cronbach's coefficient is 0.89, retest reliability coefficient is 0.87, Cronbach's coefficient of each subscale is 0.50-0.83.

*Blood glucose and blood lipid levels:* 3 mL of venous blood was taken from patients in the two groups in the morning before and after the intervention, respectively. Serum was taken after 3500 r/min centrifugation. Fasting blood glucose (FPG), triglyceride (TG) and total cholesterol (TC) were detected by Hitachi 7600 automatic biochemical analyzer before and after treatment. All steps were carried out in strict accordance with the instructions, and the adverse reactions of the two groups were compared.

*Indicators of renal function:* Blood urea nitrogen (BUN), serum creatinine (Scr) and creatinine (Cr) are important indicators commonly used in clinical assessment of renal function. Blood urea nitrogen (BUN) mainly reflects the excretion of protein metabolites in the body. When kidney function is impaired, the kidneys' ability to excrete urea nitrogen decreases,

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**Table 1.** Comparison of baseline data between the two groups

	Observation group (60)	Control group (60)	t/ $\chi^2$	P-value
Average age (years)	54.6±2.8	54.8±3.1	0.428	0.334
Gender (Male/female)	25/35	24/36	0.034	0.853
Education level (n)			0.045	0.831
High school and below	45	46		
Above high school	15	14		
Type of work (n)			0.745	0.388
Mental work	44	48		
Manual labor	16	12		
Sources of medical expenses (n)			0.036	0.850
Medical insurance	37	38		
Self-financing	23	22		
Primary disease			3.135	0.209
Glomerulonephritis	27	23		
Diabetic nephropathy	20	17		
Hypertensive nephropathy	13	20		

causing its concentration in the blood to rise. For example, in patients with chronic nephritis, BUN values may gradually increase as the disease progresses. The changes of serum creatinine (Scr) and creatinine (Cr) values can sensitively reflect the glomerular filtration function. In acute kidney injury, the Scr usually rises rapidly in a short period of time.

### Statistical methods

The data of all renal failure patients included in our study were imported into SPSS 26.0 software for data analysis. Gender, Education level, Type of work, Sources of medical expenses, Primary disease and other statistical data were expressed as integers or percentages.  $\chi^2$  test was used for comparison between groups, and rank sum test was used for ordered variables. Age, PA, ALB, TP, IGB and other measurement data were represented by mean  $\pm$  standard deviation. Data meeting normal distribution were represented by two-independent sample t-test. *P*-value <0.05 indicated a statistically significant difference.

## Results

### General comparison of research results

Our study found that the average age, gender, education level, job type, source of medical expenses and primary diseases of Observation

group patients had no significant difference compared with the Control group. The difference was not statistically significant (*P*-value >0.05). See **Table 1**.

### Comparison of nutritional status

The nutritional status changes of the two groups of patients pre-intervention included four nutritional indexes of PA (mg/L), ALB (g/L), TP (g/L) and IGB (g/L). Compared with pre-intervention, the four indicators of PA, ALB, TP and IGB of the Observation group were significantly improved post-intervention. In the Control group, only ALB,

TP and IGB showed significant improvement post-intervention, while PA showed no significant change. The difference was statistically significant (*P*-value <0.05). See **Table 2**.

### Comparison of lumbar soreness score and blood glucose and lipid levels

The changes in lower back pain and muscle weakness score as well as FPG (fasting blood glucose), TG (triglyceride) and TC (total cholesterol), the four biochemical indexes pre-intervention were measured in the two groups. The Observation group had significant improvement in the four indexes of post-intervention lumbar soreness score, FPG, TG and TC, while the Control group had no significant change in lumbar soreness score and TC. The difference was statistically significant (*P*-value <0.05). See **Table 3**.

### Comparison of sleep quality scores

The sleep quality score changes of the two groups pre-intervention included six indicators: sleep duration, time from getting into bed to falling asleep, sleep quality, daytime dysfunction, sleep disturbance and sleep frequency. All six indicators of the Observation group showed significant improvement post-intervention compared with pre-intervention. In the Control group, there were significant improvements in sleep time, sleep quality, sleep distur-

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**Table 2.** Comparison of nutritional status between the two groups ( $\bar{x}\pm sd$ )

	PA (mg/L)		ALB (g/L)		TP (g/L)		IGB (g/L)	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Observation group (60)	182.92±14.79	206.58±13.90	29.88±1.62	33.96±1.14	62.52±3.22	66.28±2.65	94.14±3.56	99.56±3.20
Control group (60)	180.96±14.99	191.38±12.95	30.00±1.70	32.22±1.33	62.42±3.07	63.26±2.84	94.10±3.50	96.60±3.46
<i>t</i>	0.658	5.658	-0.361	7.007	0.159	5.496	0.057	4.441
<i>P-value</i>	0.512	<0.001	0.719	<0.001	0.874	<0.001	0.955	<0.001

**Table 3.** Comparison of lower back pain and muscle weakness score and blood glucose and lipid levels between the two groups ( $\bar{x}\pm sd$ , mmol/L)

	Lumbar pain and weakness score		FPG		TG		TC	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Observation group (60)	3.27±0.49	2.10±0.98	8.57±2.48	5.08±1.72	3.68±1.24	1.35±0.68	6.16±1.53	3.35±1.31
Control group (60)	3.29±0.52	2.72±0.96	7.62±2.52	6.96±1.38	3.59±0.71	2.82±0.96	6.25±0.88	3.04±1.05
<i>t</i>	1.757	2.370	1.772	2.331	1.413	2.254	0.394	4.913
<i>P-value</i>	0.082	0.020	0.079	0.022	0.268	0.026	0.346	<0.001

**Table 4.** Comparison of sleep quality scores between the two groups ( $\bar{x}\pm sd$ )

	Sleep time		Time from getting into bed to falling asleep		Sleep quality	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Observation group (60)	2.28±0.17	1.19±0.23	2.31±0.25	1.07±0.22	2.63±0.11	1.13±0.27
Control group (60)	2.25±0.20	1.67±0.17	2.29±0.14	1.58±0.30	2.58±0.13	1.65±0.18
<i>t</i>	0.750	11.005	0.458	8.990	1.094	10.508
<i>P-value</i>	0.456	<0.001	0.648	<0.001	0.277	<0.001

  

	Daytime dysfunction		Sleep disorder		Sleep frequency	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Observation group (60)	2.44±0.16	1.22±0.13	2.39±0.10	1.29±0.26	2.47±0.23	1.16±0.33
Control group (60)	2.50±0.21	1.69±0.25	2.43±0.27	1.84±0.18	2.39±0.18	1.74±0.40
<i>t</i>	1.490	10.602	0.911	11.405	1.796	7.334
<i>P-value</i>	0.140	<0.001	0.365	<0.001	0.076	<0.001

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**Table 5.** Comparison of renal function indexes between the two groups ( $\bar{x} \pm \text{sd}$ )

	BUN ( $\mu\text{mol/L}$ )	Scr ( $\mu\text{mol/L}$ )	Cr ( $\mu\text{mol/L}$ )
Observation group (60)	18.36 $\pm$ 4.35	426.18 $\pm$ 33.48	26.34 $\pm$ 6.49
Control group (60)	29.35 $\pm$ 6.34	527.34 $\pm$ 37.18	14.37 $\pm$ 5.05
<i>t</i>	7.829	11.074	7.973
<i>P-value</i>	<0.001	<0.001	<0.001

bance and sleep frequency, but there was no significant change in daytime dysfunction. Besides, the sleep quality scores across various dimensions were all significantly better in the Observation group compared with those in the Control group (all  $P < 0.05$ ). See **Table 4**.

### Comparison of renal function indexes

BUN levels in the Observation group were significantly lower than those in the Control group, and the difference was statistically significant ( $P$ -value <0.001), indicating that the Observation group had better renal function, especially in urea nitrogen metabolism. Scr levels in the Observation group were also significantly lower than those in the Control group, and the difference was also statistically significant ( $P$ -value <0.001). This further demonstrated that the Observation group was superior to the Control group in terms of renal function protection or recovery. See **Table 5**.

### Discussion

Kidney failure is a serious disease caused by a variety of kidney diseases, from the gradual decline of kidney function until the complete loss of kidney function [13]. The number of patients with renal failure uremia in China has increased by 11% per year since the beginning of the 21st century, which is alarming [14]. Patients with kidney failure often undergo a long and complicated course, and toxins in the body play a significant role in the decline of organ function [15]. It is important to note that these toxins not only negatively affect the kidneys themselves, but also negatively impact other internal organs, leading to a decline in the performance of the entire body. The progression of the disease results in pathological changes such as qi stagnation, blood stasis, and internal stagnation of dampness, which further exacerbates Yang deficiency constitution formation [16]. Patients with kidney failure

often have a constitution characterized by Yang deficiency, manifesting primarily as symptoms like soreness in the lower back, cold extremities, and decreased energy levels. Patients may suffer from these symptoms not only as a result of their daily lives, but also as a result of other complications

such as cardiovascular disease, anemia, osteoporosis, etc. Patients with kidney failure need to pay attention to their physical condition and rehabilitation management in addition to their drug treatment and dialysis treatment. The physical condition, symptoms and quality of life of patients can be improved through reasonable diet, exercise, and good living habits [17]. The use of traditional Chinese medicine therapies such as Acupoint Moxibustion has also shown promising results in the rehabilitation of patients with kidney disease. Increasing the flow of qi and blood through specific acupoints can enhance the function of the organs, relieving symptoms and improving patients' quality of life [18]. However, when applying these therapies, it is necessary to make a personalized treatment plan according to the specific situation of the patient and operate under the guidance of a professional doctor to ensure the safety and effectiveness of the treatment [19].

This study found that, first and foremost, the four biochemical indicators of PA, ALB, TP and IGB improved significantly after intervention in the Observation group. The Observation group showed significant improvement in only three of the five kidney function and nutritional indexes after intervention compared with the Control group. The significant improvement in PA may indicate that the intervention of the Observation group has positive effects on liver function as well [20]. There was a significant improvement in clinical symptoms in the Observation group in terms of lumbar soreness score, FPG, TG and TC. In the Control group, there was no significant change in lumbar soreness score and TC. Enhanced kidney function is linked to improved lumbar soreness, and improved blood glucose and lipids can help reduce cardiovascular disease risk. This suggests that the Observation group's intervention was more effective in alleviating clinical symptoms and improving metabolic function. Following the intervention, the Observation group experienced significant

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improvements in sleep duration, time to fall asleep, sleep quality, daytime dysfunction, sleep disturbance, and sleep frequency compared to before the intervention. Control group sleep time, sleep quality, sleep disturbance and sleep frequency improved significantly, but sleep time and daytime dysfunction did not change significantly. It is vital for recovery and immunity that patients get a good night's sleep, so the intervention in the Observation group was more effective in improving sleep quality for patients. The above analysis indicates that biochemical indicators, clinical symptoms, and sleep quality have improved more significantly in the Observation group. This may be related to the Observation group's more comprehensive and targeted Acupoint moxibustion joint and Nutritional intervention.

Moxibustion kidney acupoints indeed show their unique theoretical and technical application value in the rehabilitation management of patients with kidney failure [21]. An ancient and effective Chinese medicine therapy, moxa stick moxibustion stimulates specific points on the human body with moxa fire to prevent and treat diseases [22]. The mechanism of its good warming-tonifying effect has been confirmed by basic studies. Moxibustion can activate acupoints, promote the operation of qi and blood, regulate the neuro-endocrine-immune network, and then regulate the functions of the viscera [23]. As the core effect of moxibustion, "warming and tonifying" acts on specific parts of the human body through warming and heat stimulation, producing the effect of tonifying human qi and blood and improving its function [24]. This warming effect not only helps to improve the biochemical indicators of patients with kidney failure, such as PA, ALB, TP and IGB, but also effectively alleviates clinical symptoms such as lower back pain and muscle weakness and improves the sleep quality of patients [25]. Moxa leaves are used in moxibustion to regulate qi and blood flow through the twelve channels, treating various illnesses. Traditional medicine believes their warm nature can expel cold and balance Qi and blood flow [26]. Moxibustion for external use can strengthen Yuan Yang, warm the meridians, dispel wind and dispel cold, relax tendons and activate collaterals, and restore Yang to save the reverse. These characteristics make moxibustion leaves an ideal choice. Therefore, in the rehabilitation

management of kidney failure patients, the development of moxibustion kidney acupoints has broad application prospects. Moxibustion can improve patients' biochemical indicators, symptoms, and sleep quality, ultimately enhancing their quality of life. Personalized treatment plans are key for optimal results.

The content of the moxa sticks selected in this study is meticulously designed. With moxa wool as the main constituent, it integrates Chinese herbs such as cinnamon, dried ginger, cloves, Duhua, asarum, Angelica, etc. All these ingredients are regarded as having the effect of warming Yang in the theory of traditional Chinese medicine and can jointly exert the effect of warming and tonifying. As the main material for moxibustion, it can penetrate into meridians, harmonize qi and blood, and achieve the purpose of warming the body. Meanwhile, traditional Chinese medicines like cinnamon and dried ginger can further enhance the warming effect of moxibustion and improve the therapeutic outcome [27]. Regarding the selection of acupoints, this study specifically chose Shenshu point, which is an important acupoint of the Foot Sun Bladder Meridian. Shenshu point not only possesses the functions of tonifying the kidney and assisting Yang, regulating reproductive functions, but also can effectively alleviate the symptoms of kidney diseases such as low back pain. According to the record of "Lingshu-Backshu", Backshu point is more suitable for moxibustion rather than acupuncture because Backshu point is in charge of the transfer of qi in the zang-fu organs, and moxibustion can boost Yang qi and adjust the functions of internal organs [28]. Therefore, the application of moxibustion with a "tonic" effect on Shenshu point is in line with the theory of traditional Chinese medicine and also conforms to the therapeutic goal of this study. Research results indicate that the regular application of moxibustion on kidney acupoints can effectively relieve the symptoms of low back pain and muscle weakness in patients with kidney failure [29]. This finding not only validates the efficacy of moxibustion on kidney acupoints in the rehabilitation management of patients with kidney failure but also provides robust evidence support for future clinical practice. Through moxibustion on kidney acupoints, patients can experience a significant improvement in the symptoms of low back pain and

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muscle weakness, and their quality of life has been notably enhanced.

In the process of acupoint moxibustion combined with nutritional intervention, the nursing staff of the Observation group adopted a series of targeted evaluation, intervention, and effect evaluation measures for the symptoms of patients with lower back pain and muscle weakness. These measures not only effectively alleviated the symptoms of patients' sore waist, soft knees, and fatigue but also enabled patients to truly experience the professional nursing services of bedside nurses. For the symptom assessment of lower back pain and muscle weakness, the nursing staff adopted professional assessment tools and methods and comprehensively collected the patient's symptom information. By carefully inquiring about the medical history, observing the symptom manifestations, and conducting relevant examinations, the nursing staff could accurately determine the degree and influencing factors of the patient's symptoms, which provided an important basis for the subsequent development of personalized intervention programs [30]. In acupoint moxibustion and nutritional intervention, nurses carefully selected suitable acupuncture points for moxibustion treatment according to the specific conditions of patients. Simultaneously, based on the nutritional needs of the patients, a personalized nutritional intervention program was developed to promote the physical rehabilitation of the patients. During the implementation process, nurses strictly adhered to the operational norms to ensure the safety and effectiveness of moxibustion and nutritional intervention [31]. The nursing staff also regularly evaluated the effects of the intervention and continuously optimized the intervention program by comparing the changes in patients' symptoms before and after the intervention, as well as collecting patient feedback. This kind of continuous effect evaluation not only helps to improve the quality of nursing services but also can provide useful references for future clinical practice. The patients not only experienced the professional nursing service of the bedside nurse but also felt the unique charm of traditional Chinese medicine nursing technology.

Our study included only 120 patients, which may be considered a relatively small sample

size. This may limit the generalization of the results to a larger group of patients with kidney failure. The study design made no mention of participants' or researchers' blindness. This can introduce bias in the results, as both parties may be influenced by their expectations or knowledge of the intervention. The intervention lasted only four weeks. While this may be enough to observe some short-term effects, it may not capture the long-term benefits or potential risks of the intervention. Our study did not mention any follow-up after the intervention period. This makes it difficult to assess the sustainability of the observed improvements or any potential delayed effects.

Acupoint moxibustion, as a traditional Chinese medicine therapy, has indeed shown some effect in the rehabilitation management of patients with kidney failure. By stimulating specific acupuncture points, moxibustion can regulate the movement of qi and blood in the human body, thereby improving the overall condition of the patient. Acupoint moxibustion has shown positive effects in improving blood sugar and lipid levels. For patients with kidney failure, metabolic disorders often lead to abnormal blood sugar and blood lipids. Moxibustion can lower blood sugar and lipid levels, improve kidney function, and enhance sleep quality in patients with kidney failure.

Moxibustion helps to improve the sleep quality of patients by soothing nervous emotions and regulating qi and blood, so that they can get better rest and recovery. Acupoint moxibustion is also effective in relieving symptoms of weak lumbar soreness. Patients with kidney failure often have symptoms such as back pain, fatigue and weakness, which seriously affect the quality of life of patients. Moxibustion can relax tendons, activate collages, warm Yang and dispel cold by stimulating kidney channel, bladder channel and other related points, thus relieving the symptoms of lower back pain and muscle weakness. Acupoint moxibustion also has a role in improving the nutritional status of patients. Patients with kidney failure often have the problem of malnutrition, moxibustion by regulating the function of the spleen and stomach, promote appetite, help to improve the nutritional status of patients, and improve the body's resistance.



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## Disclosure of conflict of interest

None.

## Abbreviations

PA, Prealbumin; ALB, Albumin; TP, Total Protein; IGB, Immunoglobulin; PSQI, Pittsburgh Sleep Quality Index; FPG, Fasting Plasma Glucose; TG, Triglyceride; TC, Total Cholesterol; BUN, Blood urea nitrogen; Scr, Serum creatinine; Cr, Creatinine.

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