



# Comprehensive Analysis of Treatment, Disease Burden, and Quality of Life in Patients with Hypoparathyroidism

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**Abstract:** Objective: The purpose of this study was to gain insight into the current status of treatment, disease burden, and the impact on the quality of life of patients with hypoparathyroidism (parathyroidism), to assess the effectiveness and limitations of existing treatments, and to explore the patients' need for information about the disease and their expectations of treatment options. Methods: A cross-sectional survey research method was used to collect data on parathyroidism patients' basic information, treatment regimen, frequency of treatment adjustments, treatment costs, clinical symptom control, complications, quality of life, and satisfaction by distributing electronic questionnaires through social media platforms such as WeChat. The questionnaires included patients' personal feelings, treatment outcome scores, disease burden assessment, and needs for healthcare resources. Results: Patients face multiple challenges in the treatment of parathyroidism. Most patients were on a regimen of oral calcium, active vitamin D, and magnesium supplements, but treatment adjustments were frequent, and uncontrolled clinical symptoms were present. Patients generally feel a severe impact on their physical and mental health, with limited work and social activities and low overall quality of life satisfaction. In terms of financial burden, patients suffered high out-of-pocket healthcare costs and had a low evaluation of available treatment resources. Conclusion: Parathyroidism has a significant impact on patients' lives, there are limitations in existing treatment options, and patients are in urgent need of more effective Methods of treatment and more social support. Results provide a basis for improving treatment strategies and quality of life for patients with hypoparathyroidism, pointing out directions for improvement in healthcare policy, healthcare resource allocation, and patient support. (The conclusion of this paper summarizes the main points of the paper and provides readers with clearer information. But it could be more concise and emphasize key points. I think it needs to be rephrased.)

**Keywords:** hypoparathyroidism; treatment status; disease burden; quality of life; patient needs

## 1. Introduction

Hypoparathyroidism (hypoparathyroidism) is one of the types of endocrine disease, and its pathological characteristics are mainly insufficient parathyroid hormone (PTH) secretion or overall abnormal parathyroid function, which leads to calcium and phosphorus metabolism disorders in the body [1]. Parathyroidism is rare in clinical practice, and the clinical symptoms are diverse, making diagnosis and treatment difficult [2]. After the onset of parathyroidism, the clinical symptoms are mainly chronic pain, muscle spasms, and other symptoms, and the risk of fracture is significantly increased, patients may also have different degrees of psychological problems, such as fear, resistance, anxiety, and depression under the influence of the disease [3]. On the other hand, there is no complete cure for parathyroidism, and patients need to take lifelong medication, which not only seriously affects the quality of life of patients, but also exacerbates the economic burden of patients [4]. At present, there are limited clinical studies on the treatment, disease burden, and quality of life of patients with hypoparathyroidism, and it is impossible to effectively clarify the needs of patients with hypoparathyroidism. Therefore, this study collected relevant information of patients with parathyroidism through a platform questionnaire, such as treatment process, economic burden, quality of life, information needs, etc., so as to analyze the impact of the disease on patients, aiming to explore the problems existing in clinical treatment through the analysis of comprehensive data, and put forward an effective way to improve the quality of life of patients, so as to provide a reference for the social support of patients with parathyroidism. The specific report is as follows.

## 2. Information and Methods

### 2.1 Basic Information

The results showed that a total of 146 patients participated in the questionnaire, 104 of whom were self-registered. (The

English in the paper is generally correct and easy to understand. However, some grammatical and stylistic issues could be improved to improve clarity and readability. Please check the full text carefully for similar errors and correct them.) Table 1 provides information on the gender, age, educational background, occupational status, marital status, family income, medical insurance payment method, and etiology of the patients.

**Table 1. Basic data of 146 patients**

	Baseline characteristics	Number of examples	Proportion (%)
Gender	Male	42	28.78
	Female	104	71.23
Age (years)	< 40	46	31.51
	40-60	65	44.52
	> 60	35	23.97
	Primary school & below	32	21.92
Education	Junior high school	19	13.01
	High School/Higher Vocational	21	14.38
	Junior College	19	13.01
	Bachelor's degree or above	55	37.67
Occupational status	Employed	71	48.63
	Unemployed	47	32.19
	Retired /Retire on pension	18	12.33
	Others	10	6.85
Marital status	Unmarried	29	19.86
	Married	112	76.71
	Divorced / Widowed	5	3.42
Annual household income (Thousand yuan)	< 50	53	36.30
	50-90	42	28.77
	90-130	27	18.49
	130-300	17	11.64
	> 300	7	4.79
Payment methods for medical expenses	Urban Resident Basic Medical Insurance	60	41.10
	Urban Employee Basic Medical Insurance	81	55.48
	Others	5	3.42
Causes of hypoparathyroidism	Total/partial thyroidectomy	95	65.07
	Total/partial parathyroidectomy	7	4.79
	Autoimmune	13	8.90
	Unexplained	15	10.27
	Hereditary or congenital	8	5.48
	Others	8	5.48

## 2.2 Inclusion and Exclusion Criteria

Inclusion Criteria: (1) Clinically confirmed hypoparathyroidism; (2) Complete clinical data; (3) Patients and their families voluntarily participate in the study and sign the informed consent form.

Exclusion Criteria: (1) Inability to provide complete questionnaire information; (2) Have a malignant tumor; (3) Severe organ dysfunction; (4) Suffering from immune system disorders or hematologic diseases; (5) Presence of cognitive dysfunction, history of psychiatric illness, or family history of psychiatric disorder.

## 2.3 Methods

This study used a cross-sectional survey method and distributed electronic questionnaires through social media platforms such as WeChat. The questionnaire design included the basic information of patients, treatment plan, frequency of treatment adjustment, treatment cost, control of clinical symptoms, complications, quality of life, and satisfaction. In addition, it includes patients' ratings of treatment efficacy, assessment of disease burden, and demand for medical resources.

## 2.4 Observation indicators

- (1) Basic information about the patient: gender, age, educational background, occupation, and medical insurance.
- (2) Treatment plan and adjustment: Including the number and reason for the adjustment of the patient's treatment plan.
- (3) Control of clinical symptoms: uncontrolled clinical symptoms and their impact on patients' lives.
- (4) Complications: Confirm the complications caused by hypoparathyroidism and its impact on patients.
- (5) Quality of life: Investigate the impact on hypoparathyroidism patients' lives and work.
- (6) Patient needs and expectations: the need for disease information and expectations for treatment options.

## 3. Results

### 3.1 Basic information about the patient

The results showed that a total of 146 patients participated in the questionnaire, 104 of whom were self-registered. The gender, age, educational background, occupational status, marital status, family income, medical insurance payment method, and etiology of the patients are shown in Table 1.

### 3.2 Treatment plan and adjustment

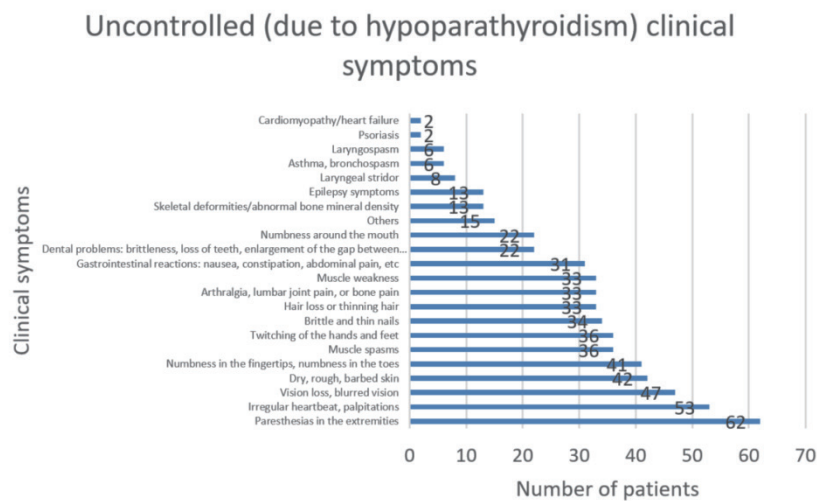
Patients are treated primarily with oral calcium, active vitamin D, and magnesium supplements. More than 60% of patients need to adjust their treatment regimens, including the inconvenience caused by multiple types of medications, large doses, and concerns about long-term complications, as shown in Table 2 below.

**Table 2. The main influencing factors for patients not taking medication as prescribed**

Influencing factors	Number of examples	Proportion (%)
It is inconvenient to take it due to too many types of drugs and too large doses	12	8.22
Difficulty taking the drug orally due to the large size of the tablet	3	2.05
Frequent forgetfulness of medication due to busy work/life schedules	14	9.59
Failure to take the drug or reduce the dose due to obvious adverse reactions after the drug	7	4.79
Fearing long-term complications, they deliberately cut back on their medications	13	8.90
Patients do not take the drug regularly because they feel that their symptoms are mild or stable	3	2.05
Discontinue medication due to lack of continuous medication, distance from the hospital, inconvenience to purchase medication, etc	6	4.11
Patient feels that there is no significant improvement in the treatment	10	6.85
The cost of treatment is higher than affordable	5	3.42
Other reasons	5	3.42

### 3.3 Control of clinical symptoms

Most patients have uncontrolled clinical symptoms, as shown in Figure 1.



**Figure 1. Uncontrolled (due to hypoparathyroidism) clinical symptoms**

### 3.4 Complications

Complications due to hypoparathyroidism have been confirmed to include depression, arrhythmias, nephrolithiasis, renal calcifications, chronic kidney disease/renal insufficiency, and cataracts. This is shown in Figure 2 below.

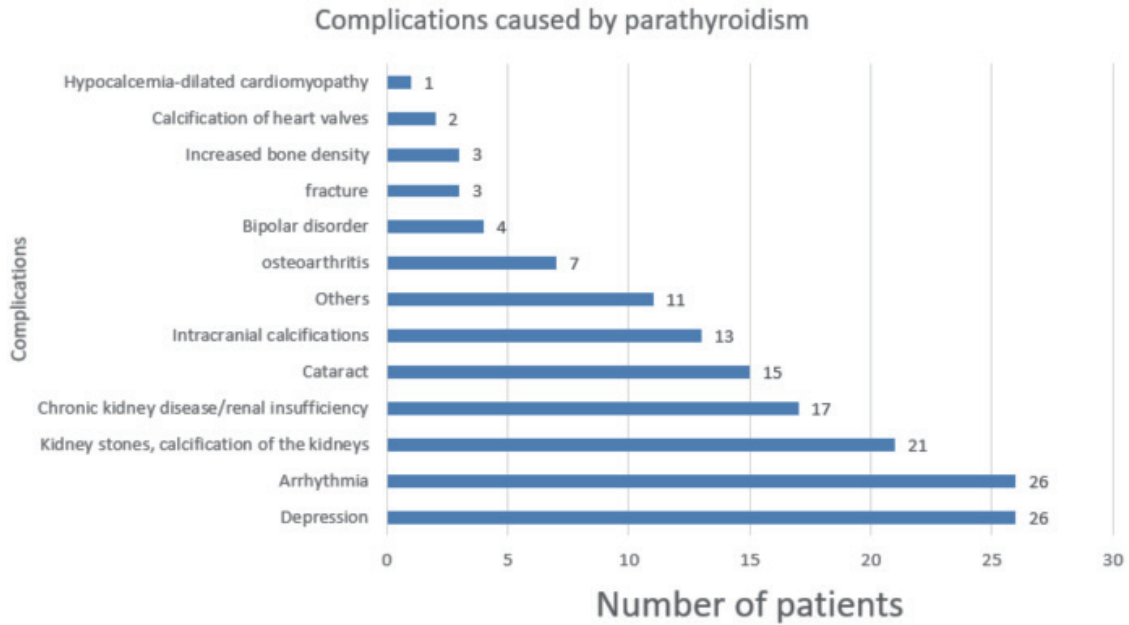


Figure 2. Complications caused by parathyroidism

### 3.5 Quality of life

Patients believe that parathyroidism has an impact on work and life. This is shown in Figure 3 below.

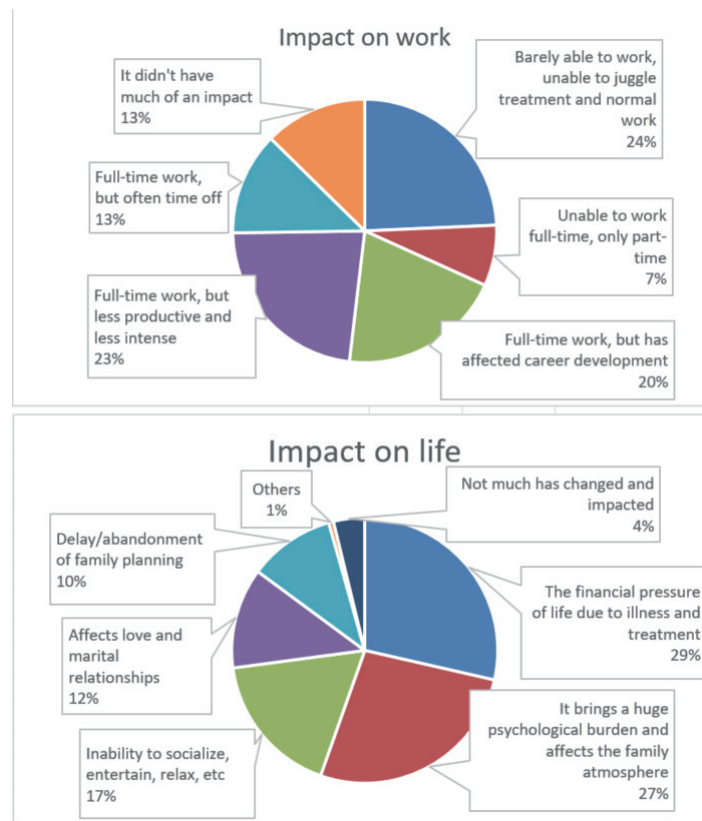


Figure 3. The impact of parathyroidism on work and life

### 3.6 Patients' needs and expectations

Patients have both a need for the efficacy of existing parathyroid-deductive regimens and an expectation for the efficacy of new parathyroid-deductive regimens. This is shown in Figure 4 below.

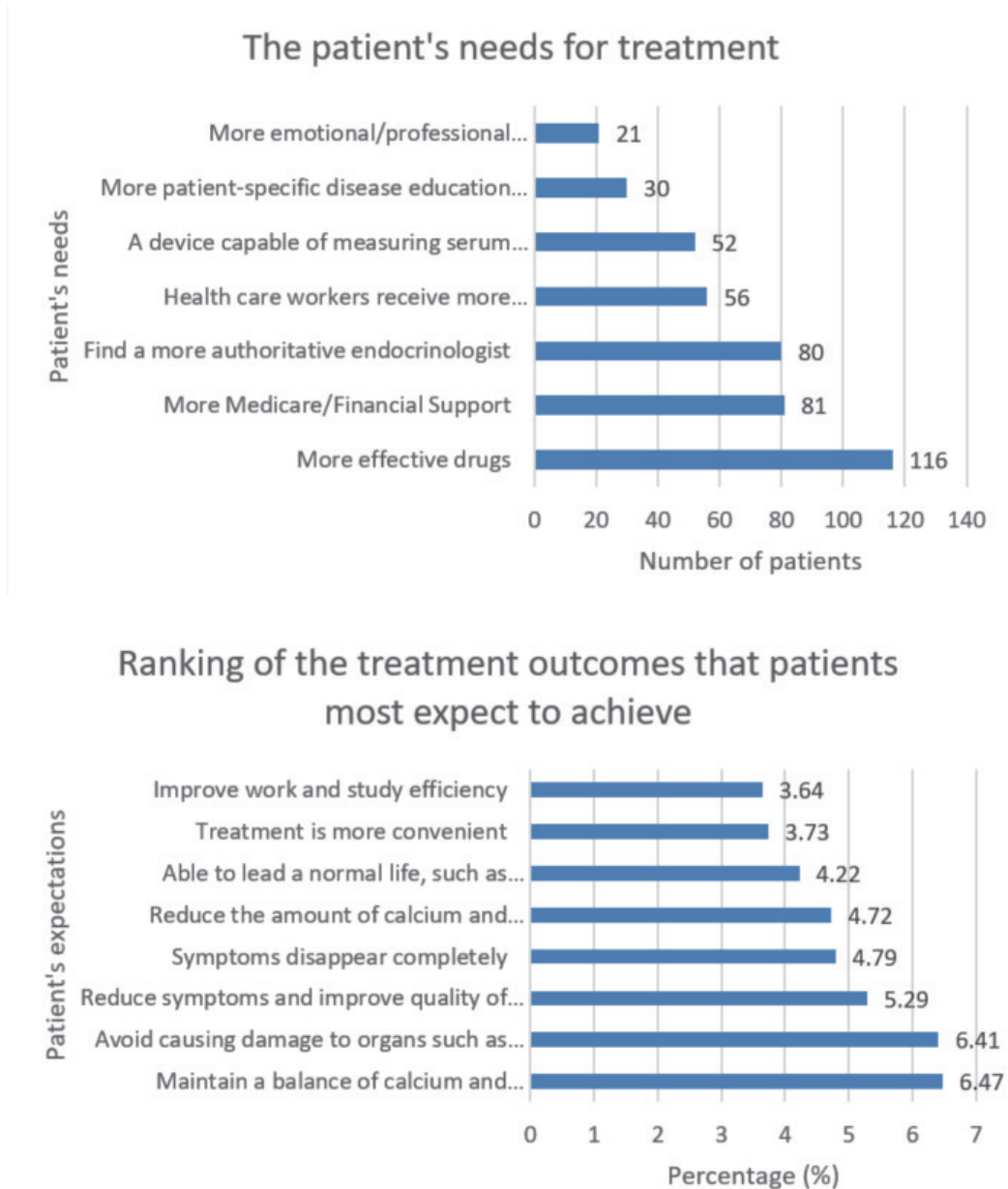


Figure 4. The needs and expectations of patients with parathyroidosis

## 4. Discussion

### 4.1 Challenges to the current status of parathyroidism

Calcium supplementation and vitamin D analogs are the most commonly used methods for the clinical treatment of patients with hypoparathyroidism, and the condition of patients can be improved to a certain extent by eating more foods high in calcium, low phosphorus, and rich in vitamin D. When patients develop hypocalcemia, patients should be given 10-20 mL of 10% calcium gluconate injection intravenously within 10 minutes, which can effectively improve the patient's symptoms and prevent the occurrence of complications such as spasms [5]. Patients with parahypothyroidism require oral calcium carbonate tablets of 0.5 to 3 g per day and vitamin D preparations can effectively improve the absorption of calcium in the intestine and increase the storage of calcium in the bones, and need to be taken after calcium supplementation, generally

calcitriol, and the dose is controlled at 0.25 to 0.50 mcg/day [6]. Patients with transient PTH reduction and hypocalcemia caused by thyroid surgery, they can recover within 1 month and up to 6 months after calcium supplementation. However, for permanent hypoparathyroidism caused by intraoperative infraction, frequent intravenous calcium therapy is required, and it is difficult to achieve the desired treatment outcome [7]. At the same time, although calcium and vitamin D can effectively improve hypocalcemia in the process of treating parathyroidism, it is difficult to achieve the ideal balance of calcium and phosphorus, and some patients may have increased urinary calcium, which may lead to complications such as renal calcium deposition and renal impairment [8]. Therefore, it is necessary to regularly test the patient's blood and urine calcium and phosphorus levels during drug treatment to ensure the stability of blood calcium levels and prevent the occurrence of related complications. At the same time, the incidence of complications such as urolithiasis can also be analyzed through the monitoring of urine calcium levels, and thiazide diuretics can be appropriately given to control urine calcium levels for high-risk patients.

On the other hand, drug therapy for parahypothyroidism is a long-term process with a high frequency of treatment adjustments. According to the analysis of the results of this study, 8.22% of the patients believed that there were many types of parathyroid in, large doses, and inconvenience. 2.05% of patients thought that the tablets of parathyroid reduction treatment drugs were large and difficult to take orally; 4.79% of patients had obvious adverse reactions after treatment; 8.90% of patients were worried about long-term complications after medication, so they deliberately reduced the dose of drugs; 2.05% of patients considered their symptoms to be mild or stable and did not require long-term medication [9]. Some patients are worried that too many calcium tablets may cause calcification and other problems. It can be seen that there are many factors for patients to not follow the doctor's prescription, but the root cause is the wrong cognition of the disease. Therefore, it is necessary to pay attention to the health education of patients in clinical practice and inform patients of the principle and necessity of drug treatment, so as to improve patients' compliance with medication and ensure the effect of drug treatment.

#### **4.2 Multidimensional impact of related complications**

Hypoparathyroidism is caused by insufficient or deficient secretion of parathyroid hormone, and is characterized by hypocalcemia and hyperphosphatemia, which has a variety of complications and may seriously affect the physical and mental health of patients. The main complications and effects are roughly as follows [10-12]:

(1) Neuromuscular system: tetany and seizures, which may cause pain, psychological stress and social disorders in patients.

(2) Skeletal system: osteoporosis, fractures, and skeletal deformities may cause pain, functional limitations, reduced quality of life and economic burden.

(3) Cardiovascular system: arrhythmia and heart failure can endanger the life safety of patients and reduce physical activity.

(4) Kidney: kidney stones, renal calcification, and renal insufficiency can damage the patient's kidney function and increase the risk of complications.

(5) Others: dry skin, rough skin, fragile hair and gastrointestinal symptoms, which can seriously reduce the comfort and digestive health of patients.

In addition, the financial burden is also one of the important issues faced by patients with hypoparathyroidism. According to the results of this study, although only 3.42% of patients are uninsured, patients with insurance still need to face high treatment costs, and at the same time, under the influence of the disease, patients are unable to work normally, which further aggravates the financial pressure on their families.

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#### **4.3 Overall reduction in quality of life**

The results of this survey show that more than 80 percent of patients believe that hypoparathyroidism has a moderate or above negative impact on their work and life, which further confirms the extensive and far-reaching impact of parathyroidism on patients' quality of life. Muscle twitches and bone pain caused by hypocalcemia can not only cause limited mobility, but can also severely interfere with sleep quality. Long-term hypocalcemia can also cause damage to bone health, which in turn increases the risk of fractures [13]. In addition, the long-term existence of the disease and the recurrence of symptoms may have a negative impact on the mental health of patients, such as triggering emotional problems such as anxiety and depression.

Patients with hypoparathyroidism often face difficulties in finding employment and social barriers due to limitations in their physical functioning, which further reduce their quality of life and social engagement [14].

#### **4.4 Patient Needs and Expectations**

Patients have a high demand for disease information, and they expect updates and more detailed information on the latest treatment options, drug information, treatment progress, and more. This finding highlights the important role of medical professionals in providing disease education and information support. At the same time, patients do not rate the available treatment resources well, suggesting that the healthcare system needs to improve the quality of services to meet the needs of patients [15].

#### **4.5 Improvement Directions and Policy Recommendations**

Based on the results of this study, we propose the following improvement directions and policy recommendations:

**Optimization of treatment options:** From the analysis of the current clinical situation, it cannot be limited to the study of clinical treatment of parathyroidism. In addition, attention should be paid to the prevention of hypoparathyroidism after thyroid surgery, the clinical indications for surgery should be clarified, the surgery should be reasonably arranged, the surgical skills of clinicians should be strengthened, and the role of drugs should be emphasized. If the patient has undergone postoperative treatment that is easy to induce parathyroid dysfunction, in order to reduce complications such as secondary transient decrease in blood calcium and convulsions, the patient can be given prophylactic calcium and active vitamin D treatment in the absence of high calcium, and the changes in the patient's blood calcium level can be closely monitored. For patients with long-term secondary hypoparathyroidism, lifelong medication is required, and health education should be emphasized in clinical practice to inform patients of the importance of medication [16]. At the same time, it is also necessary to formulate and adjust the treatment plan in combination with the characteristics of drug action, pharmacological effect, pharmacokinetics, etc., refer to domestic and foreign guidelines and relevant data of evidence-based medicine, and combine the actual situation of patients, so as to avoid adverse reactions caused by drugs and improve the overall treatment effect.

**Reduce the economic burden:** At present, some hypothyroid drugs have entered the medical insurance system, but the reimbursement ratio is limited, and there are many restrictions on reimbursement, and patients still need to face greater economic pressure for long-term medication. Therefore, relevant authorities should clarify the impact of parathyroidism on patients' lives and work, increase the types of parathyroidism drugs in the medical insurance system, enable patients to receive diversified drug treatments, and adjust drug treatment regimens in a timely manner [17]. At the same time, it is also necessary to increase the reimbursement ratio of parathyroid-related drugs in medical insurance, so as to reduce the financial pressure on patients.

**Strengthen disease education:** Most patients with parathyroidism have a limited understanding of the disease and treatment process, and traditional medical services only focus on the physiological changes of patients, ignoring health education and psychological support for patients. Therefore, medical staff should be organized to participate in the relevant knowledge training of parathyroidism, formulate corresponding training and assessment systems, and establish a reward and punishment mechanism to stimulate the active learning of medical staff, so that medical staff can be proficient in the relevant content of parathyroidism, better health education for patients, and ensure that patients can receive treatment in strict accordance with the doctor's instructions. On the other hand, patients with parathyroidism have different degrees of psychological disorders, so medical staff should pay attention to communication with patients, analyze whether patients have negative emotions such as anxiety and depression, analyze the root causes of negative emotions, and improve patients' negative emotions through psychological comfort and psychological counseling, so as to help patients build self-confidence in the disease and enable patients to face treatment with a positive and positive attitude [18].

**Provide social support:** Some patients with hypoparathyroidism are affected by the disease and are unable to live and work normally, making it difficult to integrate into society. Therefore, medical staff should establish a patient group for patients with parathyroidism, encourage patients to share their life and work experiences within the group and provide peer support for patients [19]. At the same time, medical staff should also regularly manage the disease of patients in the group, patiently answer various questions raised by patients during treatment, and guide patients to develop good living habits, so as to improve the quality of life of patients, ensure that patients can adapt to life after the onset of the disease, and better cope with the challenges brought by the disease.

### **5. Conclusion**

The limitations of this study are that the sample size is relatively small, which may affect the generality and representativeness of the results. Future studies can expand the sample size and conduct multi-center, large-sample surveys

to obtain more comprehensive and in-depth conclusions. At the same time, new treatment strategies and drugs are explored in order to improve the treatment efficacy and quality of life of patients with hypoparathyroidism. In addition, future studies should focus on long-term follow-up to assess the durability of treatment effects and the long-term prognosis of patients.

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