

# Analysis of the nursing effect of five-tone therapy combined with acupoint massage on chemotherapy of lung cancer

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## Abstract.

**BACKGROUND:** The use of complementary therapies to relieve the side effects of chemotherapy in lung cancer patients is becoming increasingly popular. Practices from traditional Chinese medicine, such as acupoint massage and five-tone therapy, have demonstrated potential in alleviating symptoms such as nausea and vomiting experienced during chemotherapy.

**OBJECTIVE:** This study aims to determine the effectiveness of combining five-tone therapy with acupoint massage in reducing chemotherapy-related symptoms in lung cancer patients. The main objective is to determine how these complementary therapies affect the quality of life and well-being of people undergoing chemotherapy for lung cancer.

**METHODS:** In this paper, 80 patients diagnosed with lung cancer who needed chemotherapy drugs were randomly divided into 2 groups, 40 patients. The first was treatment; the second was control. Chemotherapy drugs were combined with a 5-hydroxytryptamine blocker (granisetron), and acupoint massage was combined with pentatone therapy to prevent nausea, vomiting, and other gastrointestinal reactions. A 5-hydroxytryptamine blocker (granisetron) was combined with chemotherapy drugs to prevent nausea, vomiting, and other gastrointestinal reactions. Moreover, the difference in treatment effect was observed.

**RESULTS:** Among 40 cases in treatment, 13 cases were clinically controlled, 15 cases were markedly effective, 9 cases were effective, and 3 cases were ineffective. The total effective rate was 92.50%; among 40 cases in control, 6 cases were clinically controlled, 16 cases were markedly effective, 12 cases were practical, and 6 cases were invalid. The total effective rate was 85.00%.

**CONCLUSION:** By integrating traditional Chinese medicine techniques, healthcare professionals can augment the supportive care offered to those undergoing chemotherapy for lung cancer.

Keywords: Acupoint massage, pentatonic therapy, treatment, chemotherapy drugs, vomiting

## 1. Introduction

Cancer has become a public health problem all over the world. Chemotherapy is still one of the essential treatment methods for cancer patients. Chemotherapy has many side effects for cancer patients, such as nausea and vomiting, oral ulcers, constipation, and hair loss [1]. Among them, nausea and vomiting are some of the most common and unbearable side effects of chemotherapy patients. Severe nausea and vomiting can affect patients' daily functions and reduce their quality of life. Chemotherapy-induced nausea and vomiting (CINV) can be divided into three types: anticipatory CINV, acute CINV, and delayed CINV. Acute chemotherapy-induced nausea and vomiting (CINV) is frequently treated with pharmacological therapies such as corticosteroids, NK-1 receptor antagonists, and 5-HT<sub>3</sub> receptor

antagonists. These drugs work on particular pathways to reduce symptoms while CINV is in its acute stage. Acute nausea and vomiting (ANV) usually occurs within 24 hours of receiving chemotherapy and is associated with the chemotherapeutic drug-induced release of serotonin (5-HT) from enterophagelial cells; delayed nausea and vomiting (ANV), DNV occurs 24 hours after receiving chemotherapy, and it was considered to be related to multiple factors such as substance P mediation, blood-brain barrier damage, and gastrointestinal motility damage; anticipatory nausea and vomiting was related to mental and psychological factors and could be affected by e.g. vision and taste.

As the mechanism of CINV becomes more and more apparent, the application of new antiemetic drugs has greatly relieved symptoms of nausea and vomiting, but the therapeutic effect is still unsatisfactory. The primary barrier preventing novel antiemetic medications from being widely used for chemotherapy-induced nausea and vomiting (CINV) is their high cost, which also limits their accessibility and adoption in clinical settings. Cost considerations restrict the practical application of novel antiemetic medications for chemotherapy-induced nausea and vomiting (CINV). The exorbitant costs linked to these drugs create an obstacle to their availability and acceptance, which in turn affects a more extensive range of patients. Chemotherapy is one of the primary methods for the treatment of malignant tumors at present. However, the primary reaction of the gastrointestinal tract of patients after chemotherapy is nausea and vomiting, which leads to loss of appetite, decreased eating, and, ultimately, water and electrolyte disorders. Nausea and vomiting can cause water and electrolyte imbalances and dehydration, which can have an adverse effect on general health. This may result in weakness, lightheadedness, imbalances in electrolytes, and, in more severe cases, complications such as renal failure or heart problems that will affect the patient's quality of life and necessitate medical care. Severe vomiting can affect the treatment of cancer patients and reduce their quality of life [2]. Although many methods have been used clinically, such as the application of antiemetic drugs, the effect is not satisfactory, and it directly affects patients' psychological status, nutritional status, social and interpersonal relationships, and quality of life.

Traditional Chinese medicine (TCM) believes that the toxicity of chemotherapeutic drugs can disturb the body's qi and blood, damage gastric transport and chemical function, make it unbalanced, and lead to vomiting. Acupoint stimulation is recommended as an effective adjuvant therapy for improving CINV, according to a consensus published by the National Institutes of Health. As a method of non-invasive acupoint stimulation, acupoint pressing is easy to learn and avoids side effects caused by acupuncture [3]. Pressing on specific acupoints can stimulate the qi of people's meridians to activate meridians, adjust people's functions, and eliminate pathogenic factors. Studies have shown that acupressure can relieve various symptoms in patients, including pain, constipation, insomnia, fatigue, and gastrointestinal discomfort [4]. Domestic and foreign studies are still controversial on the alleviation effect of acupoint pressing on CINV, and there are great differences in massage time and acupoint selection. Through a combination of five-tone therapy and acupoint massage, the duration, frequency, and severity of nausea and vomiting in patients with lung-spleen-qi deficiency type of lung cancer undergoing chemotherapy have been improved. It is anticipated that stimulating the P6 acupoint during acupoint massage can lessen nausea and vomiting by lowering the back and alleviating vomiting. By activating the autonomic nervous system, this technique influences the release of neurotransmitters such as serotonin and promotes relaxation. These physiological outcomes support acupoint massage's antiemetic properties and help with symptom relief. TCM concepts are integrated with acupoint massage and pentatone therapy to avoid nausea, vomiting, and gastrointestinal problems. Pentatone therapy employs music, color, scent, taste, and acupoint stimulation in addition to targeted energy pathways to promote balance, whereas acupoint massage targets specific energy routes. They improve antiemetic effects and symptom avoidance by synergistically addressing various areas. Chinese medicine believes that the human body is an organic unity. The zang-fu organs communicate with

the body surface through the meridians. The meridians connect the zang-fu organs of the human body. Therefore, when a certain zang-fu is dysfunctional, it will affect other zang-fu organs or the whole body so that the body and mind will be healthy [5]. TCM believes vomiting is caused by stomach disharmony and the reverse of qi. If evil qi invades the stomach or the stomach loses harmony, vomiting occurs. Chinese medicine believes that massage on acupuncture points can achieve effects of warming meridians and dredging collaterals, improving temper, regulating qi in the stomach, and decreasing qi of the stomach to prevent nausea and vomiting. Neiguan acupoint was first seen in the chapter “Lingshu Meridian”: “The difference between the heart of hand and main body is called Neiguan. It is two inches from the wrist and between two tendons.” Neiguan acupoint is connected to Ren meridian, Hui, and Yinwei and is one of eight confluence points of eight meridians. Through massage of Neiguan acupoint, gas of Sanjiao can be unobstructed, stomach qi can be lowered, the gastrointestinal function can be adjusted, the mind can be calmed, the chest can be widened, and qi can be adjusted. The relative balance of yin and yang can be achieved. Hegu acupoint belongs to the large intestine meridian of Hand Yangming and is the original point of the large intestine meridian of Hand Yangming. The treatment of Hegu acupoint can regulate meridians and the stomach, achieve peace and zang-fu organs, and achieve the curative effect that medicines cannot achieve [6]. It can be seen that massage on Hegu point can help restore gastrointestinal function and have an analgesic effect to have a certain effect on the treatment of nausea and vomiting. Massage Zusanli can regulate the function of the spleen and stomach, clear meridians, and relieve pain. A Zhongwan acupoint massage can resolve stagnation and neutralize. Therefore, continuous massage of the above acupoints has a good effect on treating nausea and vomiting. Two thousand years ago, a classic Chinese medicine work, The Yellow Emperor’s Classic of Internal Medicine, proposed “five-tone therapy”. According to the principle of five tones entering five zang-organs, different zang-fu diseases can choose different tones of music to listen to according to the mutual laws of five zang-organs. At the same time, music therapy can psychologically mobilize and activate potential emotional functions and e.g. reduce tension, anxiety, depression and terror [7]. A bad psychological state improves human immunity and stress ability. “Historical Records,” says: “Therefore, musicians are so turbulent in their blood, flow through their spirits and have a righteous heart.” Egypt said in ancient classical writings that “music is the medicine of the soul.” The department formulates pentatone therapy suitable for the patient according to the patient’s condition, such as Shang-tuned music. Moreover, there were no adverse reactions in the whole process of treatment and nursing, and the pain of patients due to nausea and vomiting was greatly alleviated, which effectively improved the quality of life of patients and finally improved the quality of nursing and kept patients optimistic and good mood [8,9]. The immune function is enhanced, which is beneficial to inhibiting and removing cancer cells to stabilize or improve the condition.

According to the principle of five-tone entering five-zang-organs, five-tone therapy can be used to treat diseases according to mutual law of restraint of five internal organs, which can mobilize and activate potential emotional functions psychologically and reduce negative psychological states such as tension, anxiety, depression and terror. The combination with acupoint massage Neiguan, Hegu, Zusanli, and other points can achieve therapeutic purpose of dredging meridians, lowering back and stopping vomiting, regulating meridians, stomach and functions of viscera, and balancing yin and yang.

## **2. Materials and methods**

### *2.1. Diagnostic criteria for lung cancer*

#### *2.1.1. Clinical diagnosis*

Conform to one of the following, and you can establish a clinical diagnosis.

- (1) With or without symptoms and signs, chest X-ray shows solitary nodules or mass shadows in lungs, edges of which are gyri-like, lobulated, and burr-like, and in a short period (2–3 months). Gyri-like, lobulated, or burr-like edges on isolated nodules or mass shadows on a chest X-ray can be beneficial in making a clinical diagnosis. These defining features frequently point toward a benign nature (e.g. granulomas and hamartomas) instead of a malignant origin. It is easier to distinguish between benign and malignant lesions when the margins are clearly defined and uneven. Additional diagnostic procedures, such as biopsies or CT scans, can be required for a definitive diagnosis and suitable treatment planning. Those who gradually increase, especially those who can rule out tuberculosis or other inflammatory lesions after short-term active drug treatment. In the diagnostic process, short-term active drug treatment helps rule out inflammatory lesions or tuberculosis by evaluating the patient's quick reaction to certain drugs. It is possible to distinguish infectious or inflammatory diseases from other causes by monitoring changes in symptoms and imaging following a brief course of targeted medication. This method helps determine the best course of action for therapy by facilitating a prompt and precise diagnosis.
- (2) Segmental pneumonia develops into lobar atelectasis in a short period (usually 2–3 months), or lobar atelectasis develops into whole lung atelectasis in a short period, or there is a mass in the root of the lung at the corresponding part, especially those with growing masses; Resorption, compression, contraction, and sticky atelectasis are examples of atelectasis or the collapsing of lung tissue. When part of a lung segment collapses due to insufficient inspiration, it is known as segmental atelectasis. Factors such as discomfort, surgical circumstances, diseases of the restricted lungs, and shallow breathing might cause this. Comprehending these origins is essential for both avoidance and efficient handling.
- (3) The above-mentioned pulmonary lesions are accompanied by e.g. distant metastasis and symptoms of invasion or compression of adjacent organs, such as destruction of adjacent bones, enlargement of hilar or mediastinal lymph nodes, short-term development of superior vena cava compression syndrome, same lateral recurrent laryngeal nerve palsy (after excluding tuberculosis and aortic disease) and cervical sympathetic ganglia (after excluding surgical trauma), brachial plexus, and phrenic nerve invasion. When superior vena cava (SVC) compression syndrome appears quickly, it needs to be treated clinically very away. Diagnosing the underlying cause, which may include tumors or inflammation in the mediastinum, depends on quick imaging techniques like CT or MRI scans. With the support of this prompt diagnosis, TB and aortic disease can be ruled out, enabling the prompt start of focused treatments like radiation, surgery, or medicine. Timely determination of the underlying cause makes accurate diagnosis and suitable action easier.

### *2.1.2. Cytological diagnosis*

Sputum, fiberoptic bronchoscope brush, suction, flushing, and other cytological specimens under a microscope; if findings are consistent with cytological diagnosis of lung cancer, diagnosis can be established. Attention should be paid to the exception of upper respiratory tract and even esophageal cancer. Thorough clinical examination, cutting-edge imaging methods, endoscopic treatments, and multidisciplinary teamwork are precautions to prevent exceptions in upper respiratory tract and esophageal cancer cases. The danger of misdiagnosis is reduced, and considering risk factors, frequent follow-ups, patient education, quality assurance, and ongoing medical education ensure appropriate therapy. A comprehensive strategy is necessary to avoid misdiagnosing esophageal and upper respiratory tract malignancies. Comprehensive patient examinations, including imaging and endoscopic techniques for precise visualization and biopsy, are part of this process. The risk of diagnostic errors can be a variety

of strategies, including tissue sample histopathological analysis, interdisciplinary teamwork, risk factor analysis, regular follow-ups, patient education, quality assurance protocol implementation, and ongoing education for medical professionals.

### 2.1.3. Pathological diagnosis

If there is no evident and identifiable extrapulmonary primary tumor, one of the following must be met before a pathological diagnosis can be established.

- (1) Lung surgery specimens confirmed by pathology and histology;
- (2) Patients with lung or bronchial biopsy specimens obtained by thoracotomy, lung needle puncture, or fiberoptic bronchoscopy and diagnosed as primary bronchial lung cancer by histology;
- (3) biopsy of cervical and axillary lymph nodes, chest wall, pleura or subcutaneous nodules, and other metastatic lesions, histological findings are consistent with primary bronchial lung cancer, and lung cancer is suspected in lung or bronchial wall, and other organ causes can be excluded clinically cancer patients.

### 2.1.4. Diagnostic criteria for TCM symptoms of spleen and stomach weakness

Main symptoms: lack of appetite, poor appetite, fatigue, abdominal distension after eating or in the afternoon, abnormal stool (filtering, rotten, hard at first and then in Tang Dynasty, and hard in Tang Dynasty).

Secondary symptoms: Shenpi is lazy to speak, has a dull mouth but not thirst, abdominal pain, nausea and vomiting, fullness, bowel sounds, pale complexion, edema, weak defecation, pale tongue, fat or tooth marks on the tongue, thin white coating, weak pulse.

A diagnosis can be made with 2 main symptoms or 1 main symptom plus 2 secondary symptoms.

## 2.2. Inclusion criteria for cases

- (1) All patients were diagnosed with lung cancer;
- (2) Those who need chemotherapy;
- (3) The TCM syndrome type conforms to the syndrome differentiation standard of card stomach weakness syndrome; for stomach weakness syndrome, weariness, pale complexion, distension of the abdomen after eating, and a weak pulse are among the TCM syndrome distinguishing criteria. This particular TCM syndrome is identified in patients using these symptoms to inform the diagnosis;
- (4) Aged 18–70 years old, Karnofsky score > 60 points, expected survival time > 3 months;
- (5) Those who signed the informed consent form for the study.

## 2.3. Case exclusion criteria

- (1) Undiagnosed as lung cancer or other malignant tumors;
- (2) Patients with brain metastases;
- (3) Those whose general state is poor and cannot undergo chemotherapy;
- (4) Patients who need surgery;
- (5) Pregnant or lactating women;
- (6) Those with allergic constitution or history of allergy;
- (7) Combined with mental disorders or unwillingness to cooperate.

A patient's reduced life expectancy, severe comorbidities, decreased organ function, and poor perfor-

mance status are among the criteria that indicate their overall state is too bad for chemotherapy. Evaluation considers general health, treatment tolerance, and possible advantages over hazards. The identification of mental illnesses or refusal to take part entails the use of screening instruments, clinical interviews, behavioral cue observation, collateral data collection, self-report measures, cultural considerations, psychological assessments, teamwork with experts, building a therapeutic alliance, and ongoing observation. Together, these actions guarantee a comprehensive mental health evaluation, a detailed comprehension of the patient's condition, and active participation in the diagnostic process.

#### 2.4. Criteria for suspending test

- (1) Serious safety problems occur during the test, and the test should be terminated;
- (2) The subjects were unwilling to continue the clinical trial and requested that it be suspended.

#### 2.5. Criteria for dropout cases

- (1) Serious adverse events, reactions, and complications occur, and it is inappropriate to continue treatment. Several conditions can lead to serious adverse events, reactions, or complications that require stopping treatment, such as severe allergic reactions, potentially fatal organ toxicity, uncontrollable side effects, deterioration of the underlying condition, emergence of secondary infections, and notable alterations in vital signs or laboratory values. To guarantee patient safety, these illnesses necessitate immediate medical attention as well as a review of the treatment strategy.
- (2) Quit voluntarily during observation;
- (3) Those with incomplete information that affect judgment of effectiveness and safety.

#### 2.6. Case source

The cases from March 2019 to December 2021 were selected to meet the diagnostic criteria of acute and subacute toxicity grading criteria for anticancer drugs. There were no differences in age, gender, and incidence. These obstacles include discrepancies in the demographic representation, possible biases, and issues in reaching perfect matching. It is necessary to carefully plan the study and consider any confounding variables to ensure uniformity in these variables. They were randomly divided into two: experimental and control.

#### 2.7. Treatment methods

Treatment group: Chemotherapy drugs were combined with a 5-hydroxytryptamine blocker (granisetron), and acupoint massage was combined with pentatone therapy to prevent nausea, vomiting, and other gastrointestinal reactions. To avoid nausea and vomiting, pentatone therapy uses acupoint massage, color, scent, taste, and music, particularly emphasizing the P6 acupoint. The therapy tries to create relaxation and balance energy flow by mixing these components. Using an all-encompassing method to lessen gastrointestinal responses, acupoint massage at P6 intensifies the antiemetic benefits.

Control group: A 5-hydroxytryptamine blocker (granisetron) was combined with chemotherapy drugs to prevent nausea, vomiting, and other gastrointestinal reactions.

The method of acupoint massage is: (1) The method of lowering back and relieving vomiting: the patient is in a supine position, and the whole body is relaxed. The nursing staff uses the palm to slowly push down from the middle of the patient's front chest to the abdomen. The patient cooperates with exhalation and sends air to the lower abdomen, repeated 20 times; (2) soothing liver and gallbladder

method: nurses put their palms side by side in the middle of the front chest and do wiping method from middle to both sides, repeated 20 times; (3) specific acupoint massage: select Neiguan acupoint, Zusanli, Hegu, and other acupoints are pressed to assist the patient to adopt a supine position, with both lower limbs lying flat on the bed, palms facing up, nursing staff standing on the side of the patient, and using thumbs of both hands to press and rub left and right sides of patient's Hegu and Hegu points. Neiguan acupoint uses palm roots or palms to cross and overlap the patient's Zhongwan acupoint and then press the left and right Zusanli points of a patient with thumb end or belly of thumb, respectively. Feel local soreness, numbness, swelling, pain, 2 to 3 minutes each time, 3 times a day for 5 consecutive days. Significantly impairing lung function overall, a lung mass at the root of the lung may have clinical ramifications, including decreased airflow, respiratory problems, and potential compression of surrounding structures. This condition requires a comprehensive evaluation and thoughtful consideration of therapy alternatives to address the bulk and its impact on lung function. According to the five-tone tones of angle, sign, palace, shang, and feather corresponding to the liver, heart, spleen, lung, and kidney of human body, and according to characteristics of chronological health preservation, patients are arranged to listen to Shang-tuned music such as golden snake dancing wildly, spring river flowers at 9–11 am Moonlight and others perform music therapy 2 to 3 times a day, each time for about 30 minutes, once a day, 10 days as a course of treatment. The five-tone tones and chronological health preservation traits are essential when scheduling music therapy sessions to correspond with the body's natural rhythms. This method seeks to improve the efficacy of therapy by synchronizing music with the body's energy flow, encouraging equilibrium, calmness, and general well-being at particular periods of the day.

#### 2.8. Safety observation

- (1) General physical examination items (body temperature, pulse, heart rate, blood pressure, weight);
- (2) Observe routine blood, urine, and stool routine;
- (3) Observe changes in liver and kidney function;
- (4) Observe changes in blood electrolytes and record medication time and adverse reactions in detail.

#### 2.9. Observation of curative effect

- (1) Efficacy of TCM symptoms: According to "Grading Criteria for Acute and Subacute Toxicity of Anticancer Drugs" formulated by WHO, the degree of gastrointestinal reactions of patients is determined: those without nausea and vomiting are grade 0, those with nausea are grade 1, and those with nausea and vomiting are grade 1. The examination of gastrointestinal reactions in TCM symptom efficacy assessments is not mainly guided by the WHO's Grading Criteria for Anticancer Drugs. The assessment criteria TCM uses are usually unique and center on tongue examination, pulse diagnosis, patterns of disharmony, and particular symptoms associated with traditional Chinese medical theories. Rather than using the WHO's grading system for anticancer medications, intestinal reactions are evaluated using TCM principles. Temporary vomiting is grade II, vomiting that requires treatment is grade III, and uncontrollable vomiting is grade IV. The degree of gastrointestinal reaction of patients after treatment was observed to determine that no vomiting was completely effective, vomiting 1–2 times/d was partially effective, vomiting 3–5 times/d was mild relief, and vomiting > 5 times/d was ineffective. The treatment aims, individual patient response and adherence to TCM principles were considered while deciding on the length and frequency of acupoint massage and five-tone therapy sessions for the observation group. Based on these variables, individualized therapy programs were created to maximize the sessions' efficacy.

Table 1  
Gender comparison of patients before treatment

Group	<i>n</i>	Male	Female	$X^2$	<i>P</i>
Treatment	40	18	22	0.055	0.826
Control	40	17	23		

Table 2  
Comparison of age (years) of patients before treatment ( $\bar{X} \pm S$ )

Group	<i>n</i>	18~	30~	40~	50~65	Minimum age	Maximum age	$\bar{X} \pm S$
Treatment	40	5	5	13	17	20	65	51.079 ± 9.137
Control	40	4	6	12	18	23	64	48.877 ± 10.525

Table 3  
Comparison of severity of illness of patients before treatment

Group	<i>n</i>	Light	Middle	Heavy	$X^2$	<i>P</i>
Treatment	40	15	19	6	0.246	0.621
Control	40	17	18	5		

- (2) Symptoms and efficacy: patients' gastrointestinal reactions (nausea, vomiting, decreased appetite) during chemotherapy.
- (3) Gastric mucosa: Check the gastroscop after patients apply chemotherapy drugs to observe changes in the gastric mucosa. The following steps are involved in post-chemotherapy gastroscop checks: preparing the patient, getting permission, giving anesthesia, inserting the gastroscop to visually evaluate the gastric mucosa, doing biopsies if necessary, recording results, and offering post-procedure care. These actions evaluate the effects of chemotherapy on the stomach mucosa and direct the course of treatment.
- (4) Serum 5-light tryptophan: Peripheral venous blood was collected before and after each chemotherapy, and serum 5-light tryptophan level was detected.
- (5) Body weight: Patients' body weight was measured every week after the test, and body weight changes of subjects were observed.

### 3. Results

The gender, age, disease severity, tongue, and pulse condition of patients are compared in Tables 1–5. As can be seen from Table 1, a comparison of gender distribution before treatment, through four-table  $X^2$  test,  $P > 0.05$ , no difference, and comparable.

As can be seen from Table 2, the age distribution was tested by Ridit analysis  $X^2$ ,  $X^2 = 0.038$ ,  $P = 0.845 > 0.05$ , and the average age was tested by  $t = 0.992$ ,  $P = 0.324 > 0.05$ , indicating that age distribution of patients was relatively insignificant. A significant difference, comparable.

As can be seen from Table 3, disease distribution was tested by Ridit analysis  $X^2$ ,  $X^2 = 0.695$ ,  $P > 0.05$ , indicating that there was no difference in disease distribution of patients, and they were comparable.

It can be seen from Table 4 that tongue images of patients before treatment were compared by  $X^2$  test of RXC table,  $P > 0.05$ ; there was no difference, and they were comparable.

As can be seen from Table 5, the comparison of pulse condition of patients before treatment, statistical analysis of  $X^2$  test of RXC table is  $P > 0.05$ , there is no difference, and it is comparable. The factors considered were pulse rate, rhythm, strength, and quality when comparing the pre-treatment pulse



Table 4  
Comparison of tongue images of patients before treatment

Group	Number of cases	Light	Light dark tongue	Other	Thin white	White and greasy tongue coating	Other
Treatment	40	20	15	5	12	25	3
Control	40	22	12	6	15	20	5
$X^2$			0.117			0.238	
$P$			0.946			0.888	

Table 5  
Comparison of pulse condition of patients before treatment

Group	<i>n</i>	Normal	Be weak	Fine slip	Other	$X^2$	$P$
Treatment	40	5	25	5	3	0.929	0.818
Control	40	5	22	6	7		

Table 6  
Comprehensive efficacy analysis

Group	<i>n</i>	Clinical control	Remarkable effect	Valid	Invalid	Total efficiency
Treatment	40	12 (32.00%)	16 (37.00%)	8 (22.00%)	4 (7.00%)	92.70%
Control	40	5 (12.00%)	15 (40.00%)	14 (30.00%)	6 (15.00%)	85.00%

Table 7  
Analysis of main symptoms and curative effect

Symptom	Group	After treatment				Intergroup	
		-	+	++	+++	$X^2$	$P$
Nausea	Treatment	20	10	6	4	8.106	0.005
Vomit	Control	15	12	8	5		

circumstances of the patients. In TCM, these elements are crucial for evaluating general health and recognizing particular patterns that inform treatment choices. To sum up, it can be seen that there was no difference in gender, age, severity of illness, tongue, and pulse conditions of patients before treatment ( $P > 0.05$ ), and they were comparable.

As can be seen from Table 6, the clinical control rate of treatment was 32.00%, the total effective rate was 92.70%, the clinical control rate of control was 12.00%, and the total effective rate was 85.00%. The curative effect of treatment was better. Tumor shrinking, the lack of new lesions, and symptom improvement are used to calculate the clinical control rate. Both complete and partial responses are taken into account by the total effective rate. Adherence to established diagnostic criteria, imaging findings, and biopsy results are critical diagnostic needs for confirming lung cancer.

As can be seen from Table 7, treatment was different from control ( $P < 0.01$ ), indicating that treatment was better than control in improving nausea and vomiting in patients undergoing chemotherapy.

As shown in Table 8 and Fig. 1, changes in symptoms and signs in treatment and control after Ridiit analyzed treatment, and there were differences in symptoms and signs between treatment and control ( $P < 0.05$ ).

As in Table 9 and Fig. 2, data were statistically processed by the  $X^2$  test of the RXC table, indicating no difference in tongue quality before and after treatment ( $p > 0.05$ ). There was no difference in tongue quality in control before and after treatment ( $p > 0.05$ ); the curative effect of treatment was not better than control ( $p > 0.05$ ).

As in Table 10 and Fig. 3, data were statistically processed by the  $X^2$  test of the RXC table. There was

Table 8  
Analysis of the curative effect of various symptoms

Symptom	Group	After treatment				Intergroup	
		-	+	++	+++	$X^2$	$P$
Eat less and be foolish	Treatment	16	19	3	2	4.732	0.035
	Control	11	13	14	2		
Abnormal stool	Treatment	20	12	6	2	4.466	0.033
	Control	15	10	12	3		
Abdominal distension after eating	Treatment	22	11	5	2	2.966	0.83
	Control	19	7	11	3		
Fatigue	Treatment	18	12	6	4	3.482	0.064
	Control	12	11	15	2		
Sallow complexion	Treatment	20	11	5	4	1.60	0.205
	Control	17	7	10	6		

Table 9  
Comparison of tongue quality before and after treatment

Group	$n$	Before and after treatment	Light	Dim	Other	In		Between groups after treatment	
						$X^2$	$P$	$X^2$	$P$
Treatment	40	Before treatment	20	14	6	0.275	0.872	2.808	0.246
		After treatment	21	14	5				
Control	40	Before treatment	22	12	6	3.26	0.195		
		After treatment	16	18	6				

Table 10  
Comparison of tongue coating before and after treatment

Group	$n$	Before and after treatment	Coating on tongue			In		Intergroup	
			Thin white	White greasy	Other	$X^2$	$P$	$X^2$	$P$
Treatment	40	Before treatment	15	20	5	0.235	0.892	0.985	0.613
		After treatment	14	20	6				
Control	40	Before treatment	15	22	3	0.393	0.822		
		After treatment	14	21	5				

Table 11  
Comparison of pulse conditions before and after treatment

Group	$n$	Before and after treatment	Pulse condition				In		Intergroup	
			Normal	Heavy and thin	Stringy	Other	$X^2$	$P$	$X^2$	$P$
Treatment	40	Before treatment	5	25	6	4	1.733	0.632	0.077	0.993
		After treatment	9	20	6	5				
Control	40	Before treatment	6	23	7	4	1.374	0.713		
		After treatment	10	21	5	4				

no difference in improvement of tongue coating before and after treatment between treatment and control ( $p > 0.05$ ), and there was no difference in curative effect.

As can be seen from Table 11 and Fig. 4, data were statistically processed by  $X^2$  test analysis of the RXC table. The pulse condition of treatment and control had no improvement before and after treatment ( $p > 0.05$ ), and there was no statistical significance. There was no difference between treatment and control after statistical analysis ( $P > 0.05$ ).

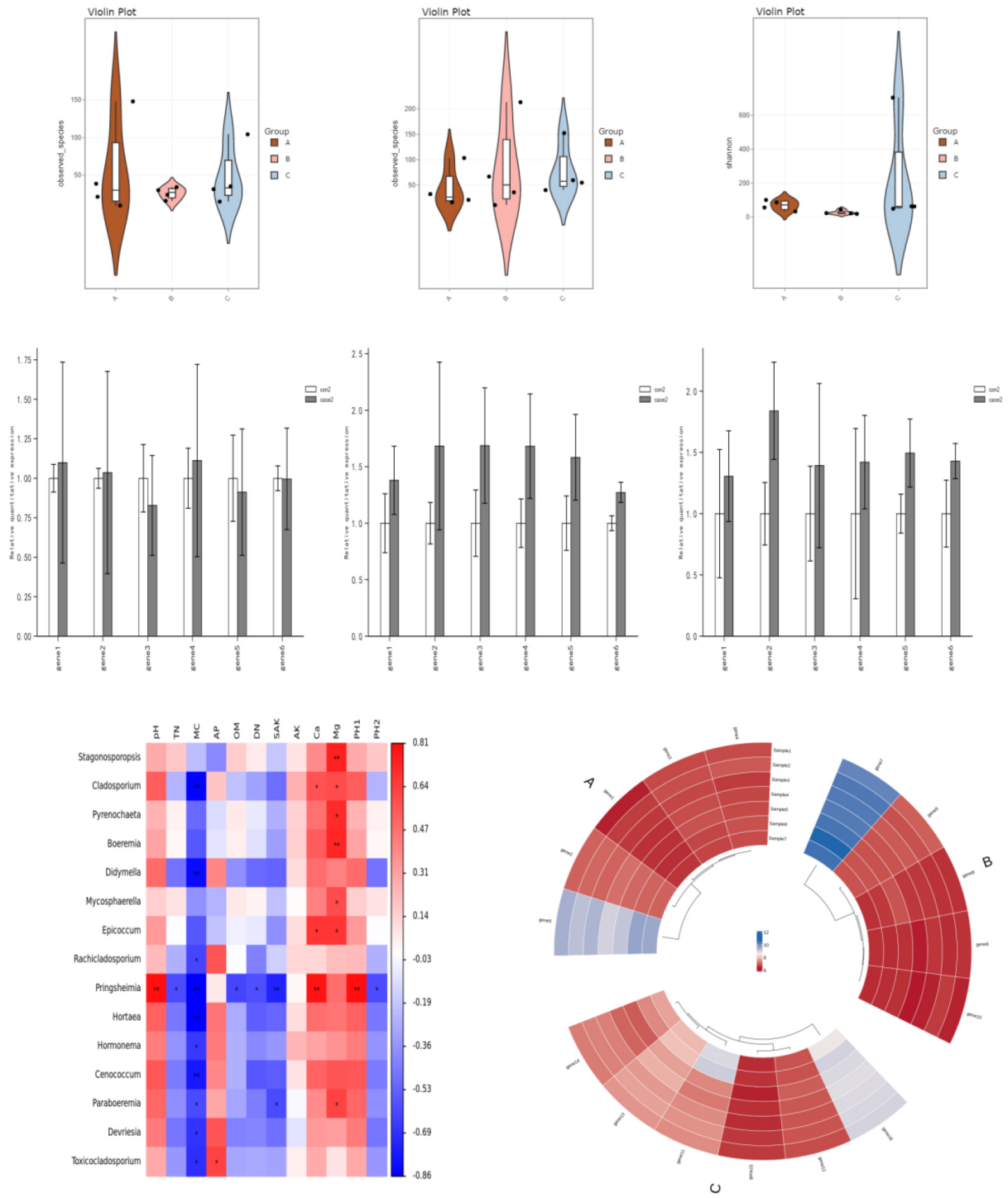


Fig. 1. Analysis of the curative effect of various symptoms.

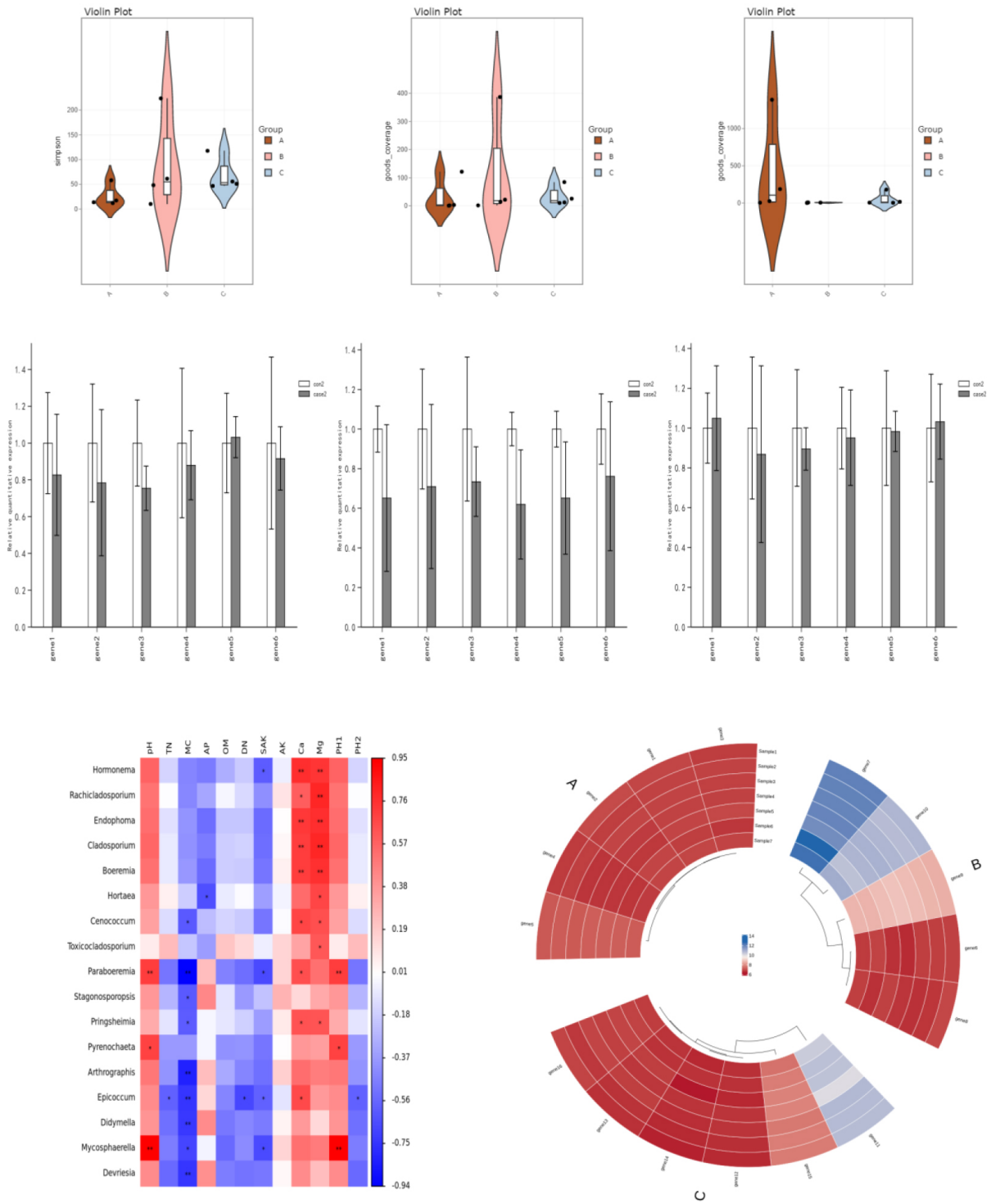


Fig. 2. Comparison of tongue quality before and after treatment.

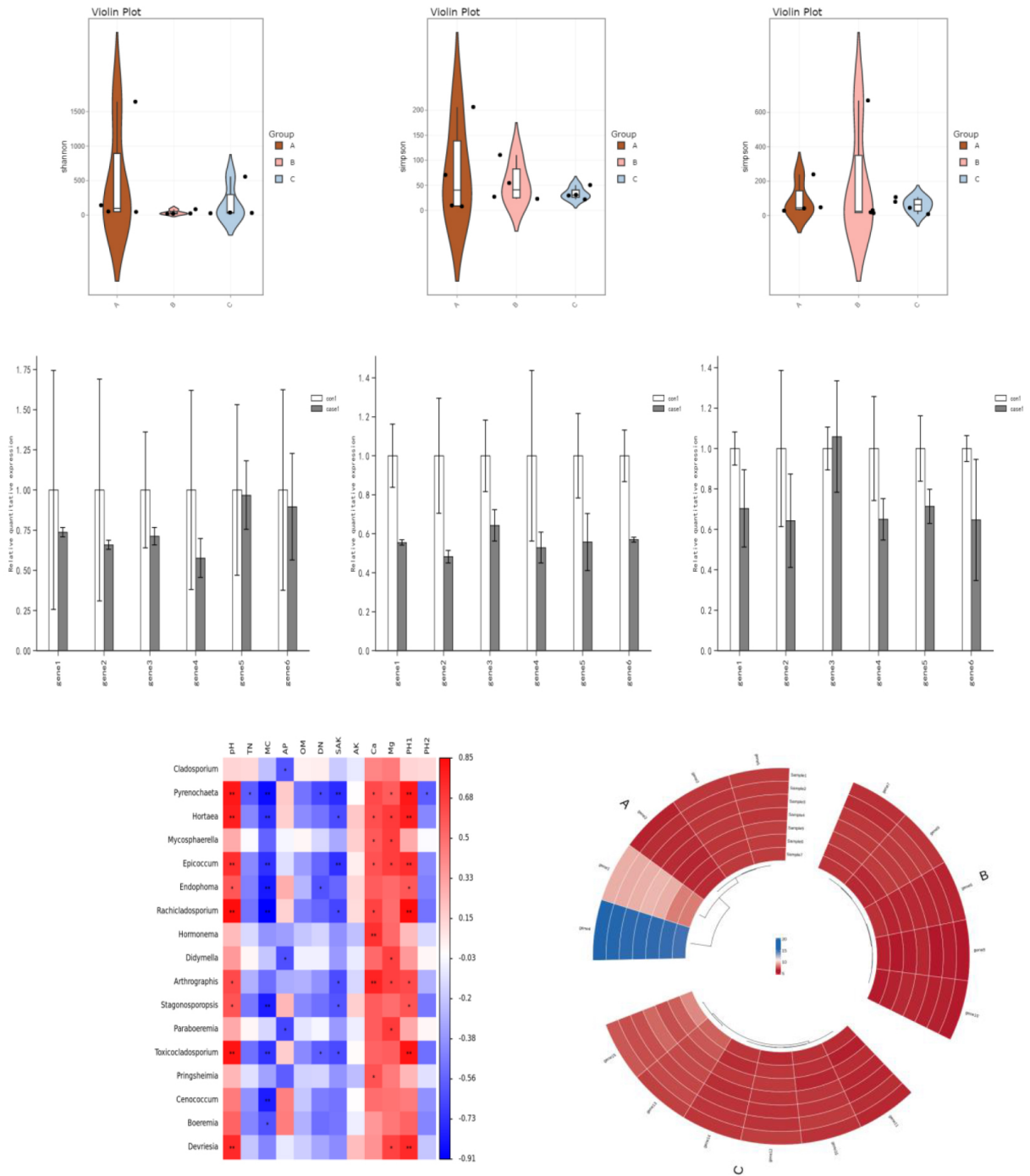


Fig. 3. Comparison of tongue coating before and after treatment.

To gain insight into the effects of treatment, statistical differences in 5-HT (serotonin) levels before and after treatment are analyzed for both the treatment and control groups. This entails evaluating

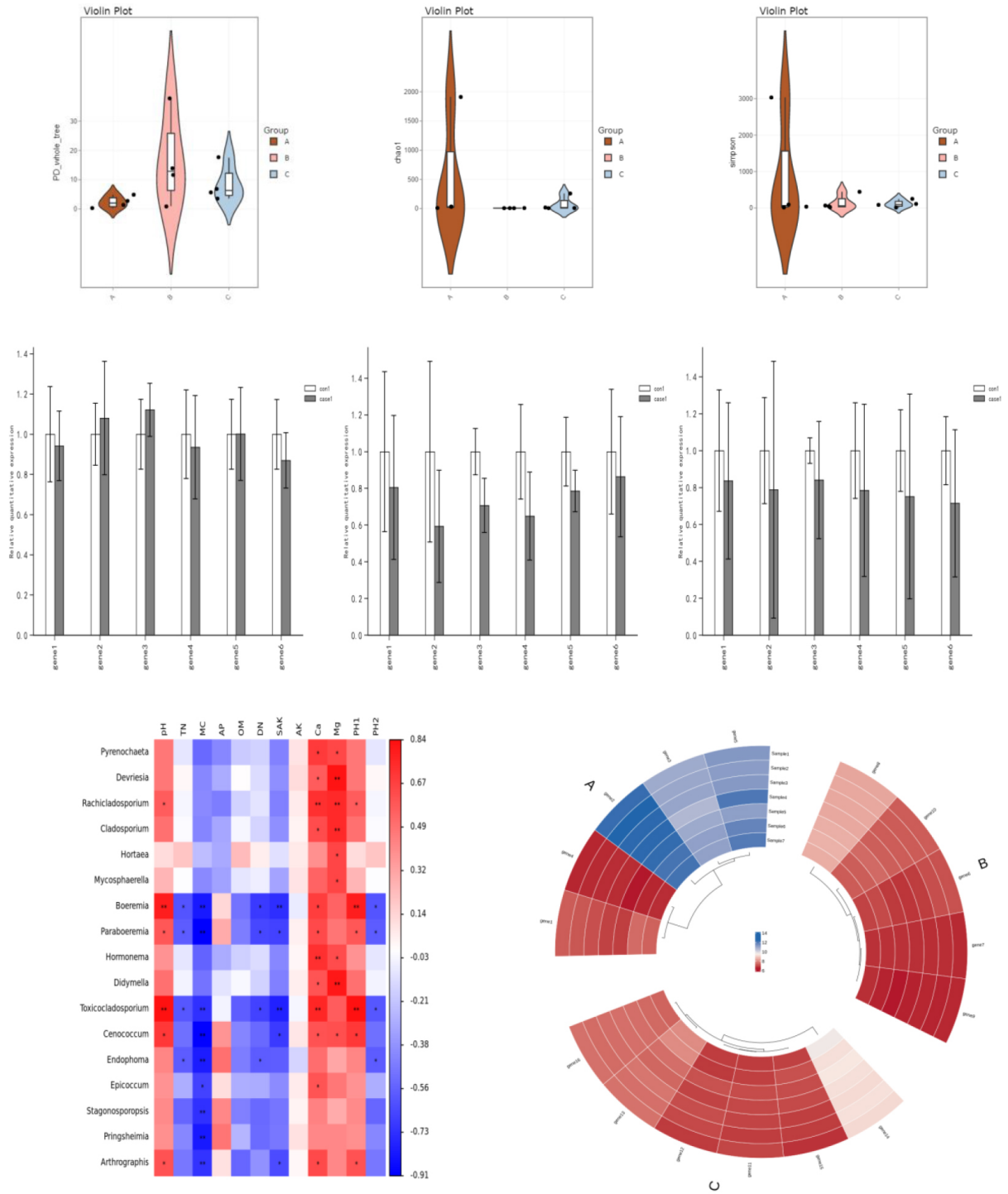


Fig. 4. Comparison of pulse conditions before and after treatment.

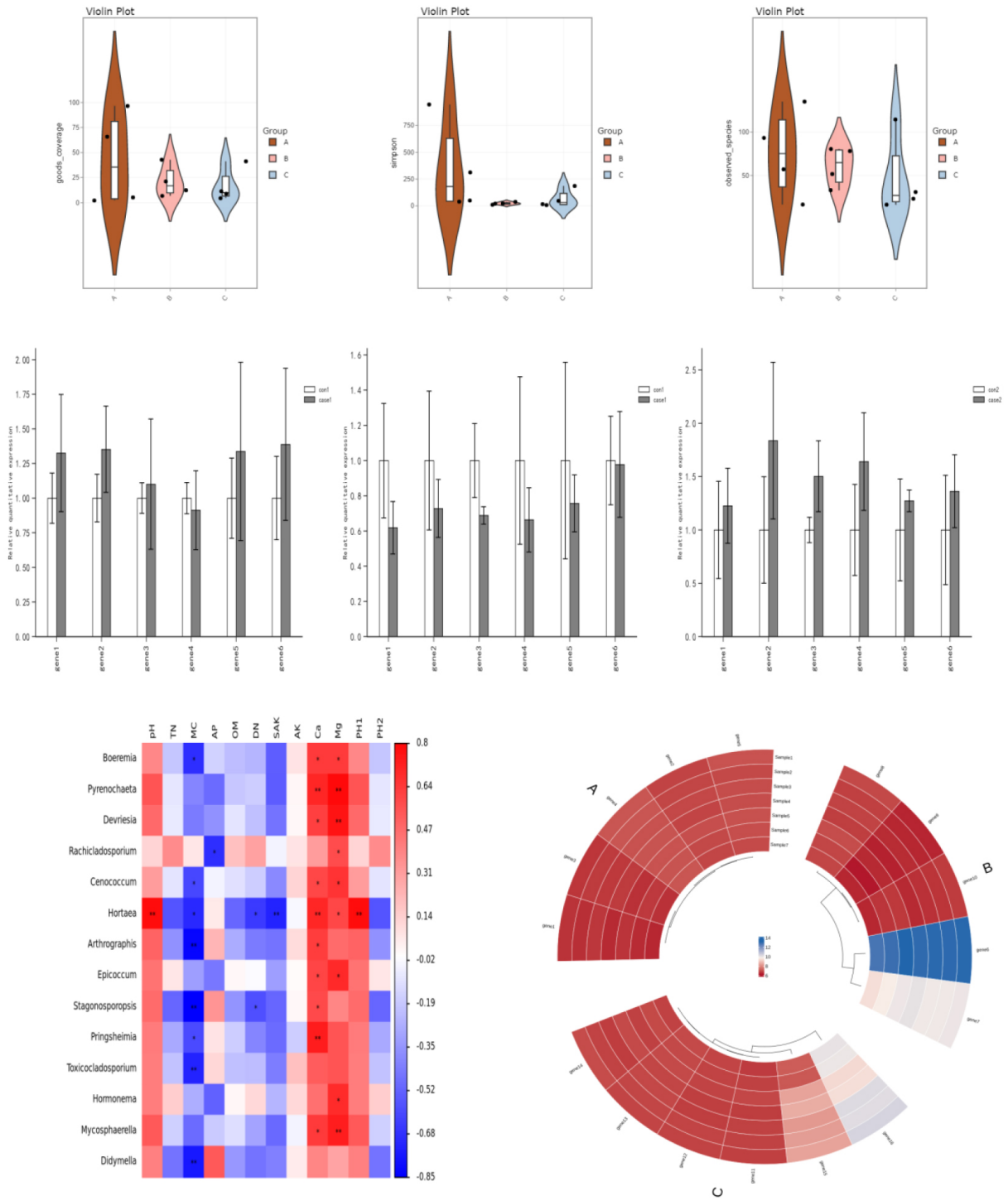


Fig. 5. Comparison of 5-HT detection values before and after treatment.

Table 12  
Comparison of 5-HT detection values before and after treatment

Group	Before and after treatment	n	5-HT ( $\bar{X} \pm S$ )	In		Intergroup	
				t	p	t	p
Treatment	Before treatment	40	158.848 ± 11.8818313	2.3366	0.0220403926062225	2.3225	0.025
	After treatment		164.403 ± 9.23857434				
Control	Before treatment	40	158.925 ± 11.288	4.44	0.0000325883538971537		
	After treatment		169.353 ± 9.819				

modifications in serotonin regulation, differentiating effects specific to the treatment from random fluctuations in the control group, and considering baseline variability. The influence of the intervention on serotonin levels can be better understood by looking at clinical correlations, subgroup analysis, and long-term effects evaluation. A *t*-test is performed on 5-HT detection values in the treatment and control groups before and after treatment to evaluate the statistical significance of changes. Establishing if the observed variations in serotonin levels are statistically significant helps reveal the efficacy of the treatment in comparison to the control group. As can be seen from Table 12 and Fig. 5, data of 5-HT detection values before and after treatment were statistically processed by *t*-test, and 5-HT detection values of treatment before and after treatment were different ( $P < 0.05$ ), and control before and after treatment 5HT There was a difference in detection value ( $P < 0.05$ ), indicating that both groups have therapeutic significance in improving 5-HT. At the same time, after treatment, two groups were compared. After statistical analysis, a difference ( $P < 0.05$ ) indicated that treatment was better than control. The data were statistically processed by *t*-test; the detection value of 5-HT in treatment before and after treatment had a very difference ( $P < 0.01$ ), and the detection value of 5-HT in control before and after treatment had a difference ( $P < 0.05$ ). At the same time, the treatment was different from the control ( $P < 0.05$ ), indicating that the treatment was better than the control in improving 5-HT.

#### 4. Discussion and conclusion

Chemotherapy is a necessary adjuvant therapy for cancer patients. As the mechanism of chemotherapy-induced nausea and vomiting has become more and more apparent, the application of new antiemetic drugs such as serotonin and NK-1 receptor blockers has greatly improved symptoms of chemotherapy-induced nausea and vomiting, especially acute symptoms [10]. By focusing on essential neurotransmitter pathways, serotonin and NK-1 receptor blockers reduce nausea and vomiting brought on by chemotherapy. Serotonin blockers reduce nausea by blocking impulses in the gut and central nervous system, such as 5-HT<sub>3</sub> receptor antagonists. Substance P's function is disrupted by NK-1 receptor blockers, further lowering nausea and vomiting signals. Combined, they work synergistically to reduce symptoms associated with chemotherapy, leading to more successful antiemetic results. However, some literature pointed out that despite a variety of antiemetic drug options, there are still some patients who experience this bad experience, and high cost limits the clinical application of new antiemetic drugs [11]. In 1997, the National Institutes of Health recommended acupoint stimulation as an adjuvant therapy for antiemetics in patients undergoing chemotherapy.

“Heaven has five syllables, and man has five viscera. Heaven has six laws, and man has six viscera.” The ancient Chinese concept of five elements of life integrates heaven, earth, natural things, and the human body's limbs and bones. The relationship between music and human diseases has been systematically expounded as early as in “The Yellow Emperor's Classic of Internal Medicine,” where the theory of



“five-tone therapy for diseases” was put forward. “Therefore, musicians, so turbulent blood, circulation of spirit and righteous heart” shows that five-element music therapy pays more attention to joint regulation of body and mind [12]. After continuous development, it is more widely used in clinical practice. According to “Huangdi Neijing,” “the principle of music therapy is the same as that of medicine therapy, and music also has its corresponding meridians and attributes.” The resonance generated by sound waves of music and meridians to which they belong can affect qi and blood of viscera and viscera. Regulate the body’s qi machine and then regulate emotions [13]. It is reported that five-tone therapy mainly uses the vibration of sound waves to make viscera produce the same frequency resonance effect so that the body’s yin and yang are balanced and emotions are smooth. TCM believes that the relationship between pentatonic scales and zang-fu organs is the core idea of traditional Chinese music therapy theory; that is, the mechanism of pentatonic regulation of emotions lies in the corresponding relationship between five zang organs and five zhi and restraint relationship between pentatonic and five zhi. In traditional Chinese music therapy, the principle of five tones controls emotions by linking different tones to different emotions and organ systems. This therapy seeks to regulate the body’s energy flow by choosing suitable tones, promoting emotional equilibrium and overall well-being. Human emotions are classified into five categories: anger, joy, thinking, worry, and fear, which correspond to the liver, heart, spleen, lung, and kidney, respectively. “Su Wen, Yin, and Yang Yingxiang Great Theory” records: “The liver is determined for anger, the heart is determined to be happy, the spleen is determined to be thinking, the lungs are determined to be worried, and the kidney is determined to be afraid.” It can lead to disorder in the circulation of qi and blood in the human body, that is, “anger will cause qi to fall, thinking will cause qi stagnation, joy will slow qi, sadness will eliminate qi, and fear will cause qi to fall” [14]. Anger hurts liver, joy hurts heart, thinking hurts spleen, sadness hurts lungs, and fear hurts kidneys.” Therefore, changes in five viscera can reflect the rise and fall of five internal organs of the human body and affect the functional state of five internal organs [15]. The “Historical Records” has a cloud: “The palace moves a card, business moves lung, horn moves liver, the heart moves slightly, and feather moves kidney,” which puts forward the view that “the five sounds move five internal organs,” indicating that five sounds can affect five organs through five internal organs [16]. On the other hand, restraining relationship of five sounds to five wills is that Jiaoyin overcomes “si,” Huiyin overcomes “worry,” Gongyin overcomes “fear,” Shangyin overcomes “anger,” and Yuyin overcomes “joy.” Restraining relationships to correct partiality of emotions, regulate qi and blood of viscera, and improve negative emotions [17]. In recent years, some studies have begun to explore the mechanism of action of pentatonics deeply. Under the guidance of traditional theory, the mechanism of electroacupuncture and music therapy on anxiety disorders, results show that the mechanism of five-tone anti-anxiety is that it can down-regulate 5-HT in the hypothalamus of rats. Scholars established an anxiety rat model through a drinking water conflict test and natural enemy exposure method. They intervened with rats using Gong Tiao and Yu Tiao in Five Elements Music [18]. Behavioral indicators related to anxiety in rats. Although related mechanism research of pentatonic therapy has been carried out one after another, compared with modern music therapy, the mechanism of emotion regulation has gone deep into molecular biology, hippocampal structure, and other levels, and the mechanism of pentatonic regulation of emotion needs to be further studied [19]. The pentatonic scale is a unique tool used in pentatonic therapy, which is different from mainstream music therapy in that it modulates emotions. This therapy uses particular musical intervals and patterns to encourage emotional responses, balance, and relaxation. With its emphasis on simplicity, pentatonic therapy creates a calming and approachable atmosphere that supports emotional regulation, in contrast to other techniques in music therapy.

As a non-invasive method of acupoint stimulation, acupoint pressing is mainly used as an acupoint stimulation point in current research, which is believed to relieve symptoms related to nausea and vomiting

caused by chemotherapy [20]. Showed that compared with the non-acupuncture group, acupuncture can alleviate symptoms of nausea and vomiting caused by chemotherapy. A single pressing of Zusanli can alleviate the severity of delayed nausea, and a single pressing of Neiguan acupoint can alleviate the severity of acute vomiting and delayed nausea and reduce the frequency and duration of acute and delayed vomiting [21]. Compared with Neiguan, pressing Zusanli was more effective in relieving the severity of delayed nausea. Combining two types of acupressure could alleviate the severity of delayed nausea but did not show a better intervention effect than single acupressure.

Chemotherapy is one of the essential treatment methods for lung cancer patients, and its purpose is to relieve symptoms, prolong life, and improve quality of life. Studies have shown that lung cancer patients' tumors shrink after chemotherapy, their clinical symptoms are relieved, their dyspnea symptoms are improved, and their overall quality of life is improved [22]. Chemotherapy targets fast-dividing cancer cells, significantly relieving symptoms in lung cancer patients. Two main processes that cause tumor shrinkage are apoptosis induction and disruption of cell proliferation. Chemotherapy medications prevent DNA synthesis and repair, inhibiting cancer cell growth. They can also stop the blood flow to the tumor or trigger the immune system to identify and destroy cancerous cells. However, with the progress of the course of treatment, adverse reactions caused by chemotherapy increase, and negative emotions such as anxiety often induce or aggravate various uncomfortable symptoms, which become relevant factors affecting the quality of life before and after chemotherapy [23]. By informing patients about side effects, encouraging adherence, providing coping mechanisms, addressing fears and concerns, and improving overall treatment understanding and support, patient education and counseling are essential in helping patients prepare for possible adverse reactions and managing the psychological aspects of the treatment process. At the beginning of the establishment of this study, we first searched, collected, and organized relevant literature and materials and finally selected five-tone therapy and acupoint massage therapy in TCM [24]. These two therapies have better intervention effects on nausea and vomiting.

The patient's comfort is high. Therefore, we first collected relevant data on five elements of music and acupoint massage required for this research and determined the final research plan based on the actual response demands of clinical patients [25]. In the process of clinical nursing intervention, all nursing staff participating in this nursing intervention research in the undergraduate department will be given targeted special training to grasp indications and application methods of five-tone therapy fully. After learning, the same doctor in the Tuina department will give them special training, not only to make them master basic manipulations of Tuina but also to locate selected acupoints [26] more accurately. The physician's education in the Tuina department guarantees precise acupoint selection, which is essential to treatment. During Tuina therapy, these acupoints selected by the principles of TCM are essential for regulating energy flow, encouraging relaxation, and treating particular health issues. After patients were enrolled, they were randomly divided into observation and control; control was only given drug treatment, observation was combined with acupoint massage and five-tone therapy based on control, and the intervention effect was evaluated. After the intervention, observation was better than control, indicating that acupoint massage combined with five-tone therapy can relieve symptoms of nausea and vomiting in patients, which can be further popularized and applied in clinical practice.

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### Conflict of interest

The authors declare that they have no conflicts of interest regarding this work.

### Data availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

### Author contributions

Hongxia Yu is the sole authors and contributed to the design and methodology of this study, the assessment of the outcomes, and the writing of the manuscript.

### References

- [1] Liu F, Shen C, Yao L, Li Z. Acupoint massage for managing cognitive alterations in older adults: A systematic review and meta-analysis. *The Journal of Alternative and Complementary Medicine*. 2018; 24(6): 532-540.
- [2] Ruan D, Li J, Liu J, Li D, Ji N, Wang C, Li Y. Acupoint massage can effectively promote the recovery of gastrointestinal function after gynecologic laparoscopy. *Journal of Investigative Surgery*. 2021; 34(1): 91-95.
- [3] Lyu WB, Gao Y, Cheng KY, Wu R, Zhou WQ. Effect of self-acupoint massage on blood glucose level and quality of life in older adults with type 2 diabetes mellitus: A randomized controlled trial. *Journal of Gerontological Nursing*. 2019; 45(8): 43-48.
- [4] Ma X, Ye Y, Liu H, Tang L. Scalp-acupoint massage combined with five-element music therapy for one patient with insomnia caused by liver depression transforming into the fire and related nursing experience. *Chinese Journal of Integrative Nursing*. 2021; 7(10): 117.
- [5] Ju H, Ma XL, Guo H, Wang H-Y, Liu Y-H, Yang L, Tang L. Efficacy of acupoint massage versus normal treatments for acute mastitis: A systematic review. *Journal of Integrative Nursing*. 2019; 1(1): 41-50.
- [6] Zhu Y, Liu Y, Quan X. Application of acupoint massage in postpartum hypogalactia in puerpera. *Zhongguo Zhen jiu = Chinese Acupuncture & Moxibustion*. 2018; 38(1): 33-37.
- [7] Jing X, Tang S. Meta-analysis of acupoint massage in the treatment of dysphagia after stroke. *Rehabilitation*. 2022; 7(2): 29-36.
- [8] Xu FF, Zhu S, Liu Y. Application of acupoint massage combined with Acupoint Application in the stable stage of chronic obstructive pulmonary disease. *TMR Non-Drug Ther*. 2022; 5(3): 12.
- [9] Reethu R, Preetha D, Parameshwaran P, Sivaparthipan CB, Kalaikumaran T. A design of smart device for detection of oral cancer using IoT. *Int J Res Eng Sci Manag*. 2020; 3(3): 44-47.
- [10] Cui J, Di Weihua LI, Wang J, Bi F, Wang W, Wang D, Shao C. Effect of routine language therapy combined with acupoint massage on language function and intelligence in young children with developmental retardation. *Chinese General Practice*. 2020; 23(21): 2689.
- [11] Laganà AS, Garzon S, Casarin J, Franchi M, Ghezzi F. Acupoint massage to manage postoperative ileus in gynecologic laparoscopy: A New Potential Player in the Enhanced Recovery After Surgery (ERAS) Pathways. *Journal of Investigative Surgery*. 2021; 34(1): 96-98.
- [12] Guo H, Liu G, Ma X, Su R, Chen C, Ma D, Geng Q. Observation on therapeutic effect of acupoint application and massage technique in treating constipation after cerebral infarction. *Chinese Journal of Integrative Nursing*. 2022; 8(6): 93.
- [13] Ye C, Guo F, Fang Q. A Meta-analysis of the effect of acupoint massage in the prevention of gastrointestinal complications after laparoscopic surgery in adults. *Chinese Journal of Integrative Nursing*. 2019; 5(12): 43.
- [14] Tian L, Nie ST, Lou TX, Chen H, Yuan GH. Clinical observation on acupoint massage plus Vitalstim electrical stimulation for deglutition disorder after stroke. *Journal of Acupuncture and Tuina Science*. 2020; 18(6): 438-444.
- [15] Wang Y, Wei Y, Haiyan E, Tang L, Dong Y, Qin S. Observation and nursing of a patient with constipation of damp-heat type treatment by acupoint massage. *Chinese Journal of Integrative Nursing*. 2022; 8(2): 86.

- [16] He X, Xu X, Hu Z, Mo S, Wang W. Effect of acupoint massage combined with acupoint application on quality of life in patients with primary lung cancer during chemotherapy. *Chinese Journal of Integrative Nursing*. 2018; 4(10): 75.
- [17] Wang X, Lu Y, Man Y, Tang L. Abdominal acupoint massage combined with auricular point sticking and pressing for a patient with postpartum constipation with Qi and blood deficiency and related nursing measures. *Chinese Journal of Integrative Nursing*. 2022; 8(6): 103.
- [18] Liu C, Zhen R, Zhou H, Zhao J, Tang L, Chen H. Nursing experience of a patient with insomnia treated by acupoint massage combined with ginger-partitioned moxibustion. *Chinese Journal of Integrative Nursing*. 2022; 8(1): 106.
- [19] Dong Y, Haiyan E, Wang Y, Wei Y, Jiang J. Massage on meridians combined with Traditional Chinese Medicine hot compress for pain in a patient undergoing surgery for mixed hemorrhoids and related nursing management. *Chinese Journal of Integrative Nursing*. 2021; 7(6): 29.
- [20] Liu Y, Liu F, Ji H, Wang H, Li J. The effects of limb functional exercises combined with Chinese medicine acupoint massage on the gastrointestinal and immune functions of elderly bedridden patients. *International Journal of Clinical and Experimental Medicine*. 2020; 13(6): 4478-4487.
- [21] Liu Y-H, Yang L, Gong S-H, Yi X-P, Guo H. Effect of acupoint massage on cognitive dysfunction: A systematic review and meta-analysis. *Journal of Integrative Nursing*. 2019; 1(2): 107-114.
- [22] Yang Y, Hu S, Wang H, Wang X, Fan Y, Xu J, Tang L. Acupoint massage on meridians in the treatment of insomnia of heart and spleen deficiency type after stroke. *Chinese Journal of Integrative Nursing*. 2021; 7(12): 108.
- [23] Li C, Yang Y, Fan Y, Jia T, Hu S. Clinical effect of auricular point pressing with beans combined with acupoint massage in the treatment of post-stroke constipation with Qi deficiency syndrome. *Chinese Journal of Integrative Nursing*. 2021; 7(9): 75.
- [24] Lu WY, Shen JF, Shen LP, Zhu JF. Effect of acupoint massage plus acupoint sticking therapy for the stress reaction during the postoperative anesthesia recovery period in patients undergoing nasal endoscopic surgery. *Journal of Acupuncture and Tuina Science*. 2018; 16(5): 343-348.
- [25] You T, Wang Y, Chen S, Li D. Effect of acupoint massage at Sanyinjiao (SP6) on relieving uterine contraction pain after cesarean section. *Chinese Journal of Integrative Nursing*. 2019; 5(11): 39.
- [26] Zhang X, Zhou C, Lin J, Zhang S. Application of acupoint massage combined with intracavitary electrocardiogram in the tip location of peripherally inserted central catheter lines. *Chinese Journal of Integrative Nursing*. 2020; 6(7): 131.