

The Impact of Internal Nourishing Qigong Combined with Acupoint Application on Anxiety and Depression in Gastrointestinal Cancer Patients Undergoing Chemotherapy

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Abstract: Objective: To explore the intervention effect of internal nourishing qigong combined with acupoint application on anxiety and depression in patients undergoing chemotherapy for gastrointestinal tumors. Methods: A total of 144 patients with gastrointestinal tumors, admitted to the oncology and gastrointestinal surgery departments of a tertiary hospital from October 2023 to May 2024, were conveniently selected and randomly divided into four groups using a random number table: the internal nourishing qigong group (36 cases), the acupoint application group (36 cases), the combined group (36 cases), and the control group (36 cases). The anxiety (SAS) and depression (SDS) scores of the four groups were assessed at four time points: before the intervention, after one cycle (21 days per cycle), after two cycles, and after three cycles. Results: Before the intervention, there were no statistically significant differences in baseline data, SAS, and SDS scores among the four groups ($P > 0.05$). After one, two, and three cycles of intervention, the RPFS, SAS, and SDS scores of the intervention groups were significantly lower than those of the control group ($P < 0.05$). The SAS and SDS scores of the combined group were significantly lower than those of the internal nourishing qigong group and the acupoint application group ($P < 0.05$). The SAS and SDS scores of the internal nourishing qigong group were significantly lower than those of the acupoint application group ($P < 0.05$). The main effects of the intervention and time on anxiety and depression were statistically significant ($P < 0.05$). Conclusion: Internal nourishing qigong combined with acupoint application can effectively improve anxiety and depression levels in patients undergoing chemotherapy for gastrointestinal cancer.

Keywords: Gastrointestinal Tumors; Chemotherapy; Anxiety; Depression.

1. Introduction

Gastrointestinal tumors have the highest incidence among malignant tumors of the digestive system [1]. Over the past decade, the incidence of gastrointestinal tumors in China has been on the rise [2, 3], with a trend toward affecting younger populations [4]. In addition to coping with the pain caused by the disease itself, patients with gastrointestinal tumors during chemotherapy rehabilitation also face other discomforts related to treatment, such as fatigue, anxiety, and depression [5]. Studies have shown that anxiety and depression may lead to hyperactivity of the HPA axis, elevated cortisol levels, release of inflammatory markers, unhealthy lifestyles, and behaviors, thereby exacerbating patients' anxiety and depression symptoms [6]. Anxiety and depression can reduce the quality of life of cancer patients, potentially leading to poor compliance, which may affect treatment outcomes and hinder patient recovery and survival. Clinically, pharmacological treatments are primarily used, which, although fast-acting, may cause severe adverse effects with long-term use. In traditional Chinese medicine (TCM), anxiety and depression are rooted in qi stagnation, and treatment should focus on regulating qi and relieving stagnation. However, treatment options are limited. This study implemented an intervention combining internal nourishing qigong with acupoint application in patients undergoing chemotherapy for gastrointestinal cancer and achieved certain results. The report is as follows.

2. Subjects and Methods

2.1. Subjects

A total of 144 patients due to gastrointestinal cancer, admitted to the oncology and gastrointestinal surgery departments of a tertiary hospital from October 2023 to May 2024, were conveniently selected as the study subjects. Inclusion criteria: (1) Pathologically confirmed gastrointestinal cancer patients currently undergoing chemotherapy; (2) TCM diagnosis consistent with spleen qi deficiency syndrome; (3) RPFS score > 3 before chemotherapy; (4) SAS and SDS scores ≥ 50 ; (5) Ability to read, communicate, and express; (6) Expected survival time ≥ 3 months; (7) Patients with clear consciousness who can sign informed consent and voluntarily participate in the study. Exclusion criteria: (1) Patients receiving other interventions; (2) Patients with other tumors or severe heart, brain, kidney, or other systemic diseases; (3) Patients with motor dysfunction; (4) Patients with mental illnesses; (5) Patients allergic to the herbal components used in acupoint application. Dropout criteria: (1) Patients who voluntarily withdraw from the study and cannot cooperate; (2) Patients with poor compliance during the intervention; (3) Patients transferred to other hospitals during the study; (4) Patients who die during the study.

2.2. Intervention Methods

2.2.1. Control Group

Routine care was provided, including health guidance, nutritional support, sleep guidance, psychological care, and exercise guidance. Specific measures included nutritional support, advising patients to improve their diet by consuming appetite-enhancing foods such as tomatoes, fish soup, and hawthorn, as well as foods rich in vitamins and proteins like lean meat, fish, eggs, beans, fresh vegetables, and fruits. Additionally, a low-fat, low-salt diet was recommended during chemotherapy. Psychological care involved encouraging patients to maintain a positive mindset, build confidence, communicate with family and medical staff, and participate in activities based on their interests to distract themselves and reduce psychological burden. Sleep guidance included avoiding staying up late and drinking 150-200 mL of milk before bed. Exercise guidance recommended light activities such as walking and Tai Chi, gradually increasing activity levels based on the patient's physical condition.

2.2.2. Acupoint Application Group

In addition to routine care, patients received acupoint

application. The selection of acupoints was based on TCM theory and relevant literature on acupoint application for alleviating cancer-related fatigue [7, 8]. Under the guidance of TCM experts, the acupoints Zusanli (ST36), Sanyinjiao (SP6), and Qihai (CV6) were selected for patients meeting the inclusion criteria. The acupoint application patches were developed by the Traditional Chinese and western medicine tumor characteristic outpatient clinic and produced by Tianjin Taibao Technology Development Co., Ltd. The patches were applied to Zusanli, Sanyinjiao, and Qihai after cleaning the local skin. The treatment was administered once daily for 6 hours each time, with a 21-day treatment cycle. During the treatment, patients were closely monitored for skin allergies, damage, or other adverse reactions.

2.2.3. Internal Nourishing Qigong Group

In addition to routine care, patients in this group practiced internal nourishing qigong, including the primary exercise "Happy Patting" and the intermediate exercise "Yijin Xingqi," accompanied by the music "Hanshan Yue."

Table 1. Specific actions and intervention objectives

Work method	Intervention goal	content
JingGong practice method	For the tired and anxious, improve the fatigue	Postures: Supine or right-side lying, sitting or cross-legged sitting, medium or low stance; Breathing: Natural breathing - pause breathing; Mind focus on Dantian and Zhongwan: 1. Middle Dantian Opening and Closing Relaxation Method 2. Whole Body Rising and Falling Relaxation Method
Intermediate motion work exercise method	1. For patients with qi and blood deficiency, fatigue, and poor digestion, the "Soft Breathing Method" was practiced; 2. For patients with yang deficiency and qi deficiency, the "Hard Breathing Method" was practiced to improve abdominal distension, relieve bowel sounds, and promote qi and blood circulation. Beginners could start with the first three sections of the Soft and Hard Breathing Methods.	1. Yijin Xingqi Method: 1) Soft Breathing Method (first three sections): 1) Rising and Falling 2) Lying and Gazing at the Stars 3) Qi Penetrating the Rainbow 2) Hard Breathing Method (first three sections): 1) Holding the Sky and Pressing the Earth 2) Ancient Tree Coiling Roots 3) Turning and Shooting the Tiger
Happy slapping method	To unblock meridians, enhance physical fitness, promote blood circulation, relieve muscle tension, and improve gastrointestinal motility. Patients could select exercises based on their condition.	1. Six Openings and Closings 2. Shaking Hands and Patting Shoulders 3. Patting Shoulders and Tapping Mingmen 4. Patting Tian and Tapping Mingmen 5. Patting the Waist and Hitting the Hips 6. Lifting Knees and Patting Legs 7. Patting the Huantiao Point 8. Tapping Zusanli (Yanglingquan) 9. Rising and Falling Guidance 10. Meridian Patting 11. Warming the Kidneys and Rubbing the Waist 12. Closing Exercise, Abdominal Massage, Three Deep Breaths into Dantian, Raising Hands and Laughing Loudly

1) Before the first qigong intervention, the researcher conducted one-on-one interviews with patients to understand their current fatigue symptoms and selected appropriate movements for each patient. The advantages of this therapy were explained to improve patient compliance.

2) After enrollment, the researcher and responsible nurses demonstrated and guided the patients in practicing the exercises until they became proficient. Patients continued practicing at home after discharge until the next treatment cycle. Researchers addressed any issues reported by patients and monitored compliance. Any adverse reactions were immediately reported to medical staff.

3) The training steps were as follows: A qigong intervention plan was developed based on the fatigue, anxiety, and depression symptoms of gastrointestinal cancer patients undergoing chemotherapy.

4) Treatment cycle: Patients practiced once daily for 30 minutes, with a 21-day treatment cycle.

2.2.4. Combined Group

In addition to routine care, patients in this group received both internal nourishing qigong and acupoint application interventions.

2.3. Observation Indicators

1) General information questionnaire: Included basic information such as gender, age, and education level, as well as clinical information such as disease diagnosis, histopathological type, and clinical stage.

2) Negative emotional status assessment: The Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used. The SAS consists of 20 items, with scores between

50-59 indicating mild anxiety, 60-69 indicating moderate anxiety, and 70 or above indicating severe anxiety. The scale has good internal consistency, with a Cronbach's alpha coefficient of 0.832. The SDS consists of 20 items, with scores between 53-62 indicating mild depression, 63-72 indicating moderate depression, and above 72 indicating severe depression. The scale has good reliability and validity, with a Cronbach's alpha coefficient of 0.791. Higher scores indicate more severe anxiety and depression [9].

2.4. Data Collection Methods

Before the intervention, the researcher guided patients in completing the general information questionnaire, RPFS, SAS, and SDS, which were collected on-site. During the next hospitalization after 21 days of intervention, the RPFS, SAS, and SDS were reassessed. Data collection was conducted face-to-face by the researcher. For patients unable to return to the hospital on time, data were collected via phone or WeChat communication with patients or their families. Questionnaires were collected at four time points: before the intervention, after one cycle, after two cycles, and after three cycles.

2.5. Statistical Methods

SPSS 27.0 was used for descriptive statistics, one-way ANOVA, chi-square tests, and repeated measures ANOVA. A P -value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of General Information Among the Four Groups

This study initially enrolled 36 cases in the control group,

36 in the acupoint application group, 36 in the Neiyanggong group, and 36 in the combined group. Ultimately, 34 cases in the control group, 35 in the acupoint application group, 34 in the Neiyanggong group, and 35 in the combined group completed the study.

Group characteristics: Control group: Mean age: 63.80 ± 1.63 years; Gender: 18 males, 16 females; Clinical diagnoses: 12 gastric cancer, 22 colorectal cancer; Disease stages: 3 stage I, 10 stage II, 15 stage III, 6 stage IV. Acupoint application group: Mean age: 63.60 ± 1.89 years; Gender: 27 males, 8 females; Clinical diagnoses: 8 gastric cancer, 27 colorectal cancer; Disease stages: 2 stage I, 7 stage II, 15 stage III, 11 stage IV. Neiyanggong group: Mean age: 62.76 ± 2.06 years; Gender: 20 males, 14 females; Clinical diagnoses: 11 gastric cancer, 23 colorectal cancer; Disease stages: 2 stage I, 5 stage II, 19 stage III, 8 stage IV. Combined group: Mean age: 67.34 ± 1.63 years; Gender: 23 males, 12 females; Clinical diagnoses: 11 gastric cancer, 24 colorectal cancer; Disease stages: 3 stage I, 7 stage II, 20 stage III, 5 stage IV.

Baseline demographic data, including age and gender, were balanced and comparable across all four groups, with no statistically significant differences ($P > 0.05$).

3.2. Comparison of Anxiety and Depression Scores Among the Four Groups at Different Time Points

Before the intervention, there were no statistically significant differences in anxiety and depression scores among the four groups ($P > 0.05$). After the intervention, there were statistically significant differences in anxiety and depression scores among the four groups ($P < 0.05$). See Table 2 and Table 3.

Table 2. Comparison of Anxiety and Depression Scores Among the Four Groups Before and After Intervention ($\bar{x} \pm s$)

Item	Group	n	Before Intervention	After 1 Cycle	After 2 Cycles	After 3 Cycles	F	P
Anxiety	Control Group	34	64.15 $\pm$ 2.12	65.15 $\pm$ 2.80	64.82 $\pm$ 2.12	64.47 $\pm$ 2.42	1.927	0.130
	Acupoint Application Group	35	65.11 $\pm$ 2.31	62.51 $\pm$ 2.34 ^a	60.49 $\pm$ 2.09 ^a	58.14 $\pm$ 2.00 ^a	228.022	<0.001
	Internal Nourishing Qigong Group	34	65.15 $\pm$ 2.74	61.06 $\pm$ 2.74 ^{ab}	57.53 $\pm$ 2.73 ^{ab}	53.88 $\pm$ 2.72 ^{ab}	169.108	<0.001
	Combined Group	35	65.49 $\pm$ 2.28	59.08 $\pm$ 1.99 ^{abc}	54.23 $\pm$ 1.93 ^{abc}	49.43 $\pm$ 1.87 ^{abc}	624.880	<0.001
	F		2.019	36.309	139.451	273.951		
	P		0.114	<0.001	<0.001	<0.001		
Depression	Control Group	34	63.15 $\pm$ 2.12	63.15 $\pm$ 2.80	63.85 $\pm$ 2.09	64.12 $\pm$ 1.81	31.000	0.061
	Acupoint Application Group	35	64.11 $\pm$ 2.31	60.54 $\pm$ 2.27 ^a	59.46 $\pm$ 2.15 ^a	58.14 $\pm$ 2.00 ^a	171.012	<0.001
	Internal Nourishing Qigong Group	34	64.15 $\pm$ 2.74	59.06 $\pm$ 2.74 ^{ab}	56.53 $\pm$ 2.73 ^{ab}	53.88 $\pm$ 2.72 ^{ab}	136.357	<0.001
	Combined Group	35	63.49 $\pm$ 2.28	58.08 $\pm$ 1.99 ^{abc}	53.11 $\pm$ 1.75 ^{abc}	49.03 $\pm$ 1.82 ^{abc}	563.471	<0.001
	F		2.019	36.309	139.451	315.910		
	P		0.114	<0.001	<0.001	<0.001		

Note: a indicates $P < 0.05$ compared to the control group; b indicates $P < 0.05$ compared to the acupoint application group; c indicates $P < 0.05$ compared to the internal nourishing qigong group

Table 3. Repeated Measures ANOVA of Anxiety and Depression Scores Among the Four Groups Before and After Intervention

Item	Variable	F	P
Anxiety Total Score	Intervention Main Effect	100.129	<0.001
	Time Main Effect	717.893	<0.001
	Interaction Effect	119.281	<0.001
Depression Total Score	Intervention Main Effect	104.340	<0.001
	Time Main Effect	581.485	<0.001
	Interaction Effect	119.302	<0.001

4. Discussion

Malignant tumors often lead to anxiety and depression in patients. Clinically, pharmacological treatments are primarily used, which, although fast-acting, may cause severe adverse effects with long-term use. In TCM, anxiety and depression are rooted in qi stagnation, and treatment should focus on regulating qi and relieving stagnation. Patients practiced internal nourishing qigong while listening to "Hanshan Yue," a piece of music known for its calming and profound effects. Listening to music can stimulate the auditory nerves, act on the liver meridian, promote overall qi circulation, and help patients focus on qigong practice. By silently reciting the words "calm" and "relax" and focusing on the Dantian, patients achieved a state of mental tranquility and physical relaxation, thereby regulating emotions. The results of this study showed that the anxiety and depression scores of the intervention groups were significantly improved after one, two, and three cycles of intervention compared to the control group ($P < 0.05$). The combined group showed the best improvement in anxiety and depression, indicating that both internal nourishing qigong and acupoint application can alleviate anxiety and depression in patients undergoing chemotherapy for gastrointestinal cancer. The combined intervention was significantly more effective than the control group, consistent with the findings of Luo Qiuhu et al. [10]. Persistent anxiety and depression can lead to decreased autonomic nervous system activity. Internal nourishing qigong integrates body posture, breathing techniques, and focused intention to optimize the flow of life energy (qi) within the body [11]. Chloe Zimmerman et al. found that qigong naturally combines movement with breathing and meditation, potentially enhancing physical form while reducing stress and improving mental clarity [12]. Similar results were reported by Zhao Chenguang et al. [13]. Zusanli (ST36), a key acupoint of the stomach meridian, can stimulate the nervous system, help relax the body and mind, and reduce anxiety and depression. Sanyinjiao (SP6) regulates qi and blood circulation, maintaining the body's systems in good condition, thereby alleviating anxiety and depression [14]. Stimulating Qihai (CV6) can regulate qi and blood, stabilize emotions, and restore inner peace, helping to relieve anxiety and depression [15]. Yongquan (KI1) can regulate the functions of the heart and liver, suppress excessive fire, and alleviate anxiety and depression caused by organ dysfunction. It also improves sleep disorders, further reducing anxiety related to sleep issues [16].

5. Conclusion

Internal nourishing qigong combined with acupoint application can effectively alleviate anxiety and depression in patients undergoing chemotherapy for gastrointestinal cancer. This simple and feasible intervention has reference value for managing anxiety and depression in these patients.

References

- [1] Sung H, Ferlay J, Siegel R L, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries[J]. CA: a cancer journal for clinicians, 2021, 71(3): 209-249.
- [2] Xiao Wenbo, Zhu Guanghan, Zhu Yun, et al. Analysis of the incidence changes of major digestive system malignancies in China from 1990 to 2019[J]. Chinese Journal of Cancer, 2022, 31(09):693-700.
- [3] Chen W Q, Li H, Sun K X, et al. Report of cancer incidence and mortality in China, 2014[J]. Zhonghua zhong liu za zhi [Chinese journal of oncology], 2018, 40(1): 5-13.
- [4] Chen Wanqing, Zheng Rongshou, Baade Peter D, et al. Cancer statistics in China, 2015[J]. CA: a cancer journal for clinicians, 2016, 66(2):115-132.
- [5] Grabenbauer GG, Holger G. Management of radiation and chemotherapy related acute toxicity in gastrointestinal cancer. Best Pract Res Clin Gastroenterol. 2016; 30:655-664.
- [6] Song L, Su Z, He Y, et al. Association between anxiety, depression, and symptom burden in patients with advanced colorectal cancer: A multicenter cross-sectional study[J]. Cancer Medicine, 2024, 13(11): e7330.
- [7] Li Xiangping, Liao Wenxia, Huang Yan, et al. The effect of herbal hot compress combined with acupoint application on symptom improvement and quality of life in patients with epigastric pain[J]. Chinese Medical Innovation, 2022, 19(26): 108-111.
- [8] Chen Xue. Application of acupoint massage, ear acupressure, and herbal umbilical application combined with emotional nursing in colorectal cancer patients undergoing chemotherapy [J]. Nursing Practice and Research, 2023, 20(14):2178-2182.
- [9] Feng Xinyu, Yu Wenyong. The effect of family participatory nursing on improving the care burden of parents of children with cochlear implants[J]. Nursing Research, 2024, 38(03): 505-509.
- [10] Luo Qiuhu, Wang Zixiu. The effect of mindfulness training combined with memory refresh training on cancer-related fatigue and anxiety in lung cancer patients undergoing chemotherapy[J]. Journal of Nursing Science, 2024, 39(09):6-9.
- [11] Deadman P. A Brief History of Qigong[J]. Journal of Chinese Medicine (JCM), 2014 (105).
- [12] Zimmerman C S, Temereanca S, Daniels D, et al. A Randomized Controlled Pilot Trial Comparing Effects of Qigong and Exercise/Nutrition Training on Fatigue and Other Outcomes in Female Cancer Survivors[J]. Integrative Cancer Therapies, 2023, 22: 15347354231162584.
- [13] Zhao Chenguang, Meng Lincui, Zhu Yan. The effect of herbal acupoint application combined with psychological resilience support nursing on postoperative recovery and quality of life in gastric cancer patients[J]. Journal of Clinical and Pathological Research, 2023, 43(01):175-182.
- [14] Cai Zhen, Zhao Yin, Wang Yufeng, Wang Lei. Clinical study on "Opening the Four Gates" plus Sanyinjiao and Zusanli acupuncture for patients with mild to moderate depression undergoing hemodialysis[J]. World Journal of Integrated Traditional and Western Medicine, 2023, 18 (03): 555-559+564.
- [15] Ma Wen. Qihai Acupoint: The Sea of Qi, Embracing All Rivers[J]. Chinese Health and Wellness, 2020, 6 (10): 66-67.
- [16] Hu Chunyan. Analysis of the effect of moxibustion at Yongquan acupoint combined with ear acupressure on preoperative anxiety in orthopedic patients[J]. Qinghai Medical Journal, 2021, 51 (05): 35-38.