Effect of Operating Room Care Based on Wutong Mode on Anxiety and Depression of Patients Undergoing Abdominal Surgery: A Single-Center Retrospective Study

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Background: The existence of anxiety and depression is not conducive to the rehabilitation of patients, so it is particularly important to apply reasonable and effective nursing methods in operating room to calm the negative emotions of patients. This study aimed to investigate the impact of operating room care utilizing the Wutong mode on the anxiety and depression levels of patients undergoing abdominal surgery.

Methods: The study included 167 patients who underwent abdominal surgery at our hospital from April 2021 to April 2023. These individuals were selected as the research subjects. Based on distinct perioperative management programs, the patients were categorized into the control group (comprising 85 patients receiving conventional perioperative management) and the study group (consisting of 82 patients undergoing operating room care based on the Wutong mode). Comprehensive baseline data, as well as scores from the Pittsburgh Sleep Quality Index (PSQI), Beck Depression Inventory (BDI), Self-Rating Anxiety Scale (SAS), General Self-Efficacy Scale-6 (GSE-6), and Short-Form-36 Health Survey (SF-36), were collected from all participants. A comparative analysis was performed on sleep status, depression levels, anxiety levels, self-efficacy, and quality of life between the two groups.

Results: Following the intervention, the PSQI scores, as well as BDI and SAS scores of patients in both groups, were significantly reduced compared to pre-intervention levels ($p < 0.001$). Notably, the study group exhibited markedly lower PSQI scores, BDI scores, and SAS scores compared to the control group post-intervention ($p < 0.001$). Additionally, the GSE-6 scores of patients in both groups showed a substantial increase after the intervention compared to pre-intervention levels ($p < 0.001$). The study group demonstrated significantly higher GSE-6 scores and SF-36 scores than the control group after the intervention ($p < 0.001$).

Conclusion: The Wutong mode-based operating room care has a pronounced impact on patients undergoing abdominal surgery, demonstrating clear clinical application value. This finding offers valuable insights for the development and selection of perioperative nursing plans for patients, providing a significant reference point for healthcare practitioners.

Keywords: Wutong mode; operating room care; abdominal surgery; negative emotions

Introduction

Due to the impact of the disease, surgical trauma and treatment cost, patients with abdominal surgery are prone to negative emotions such as anxiety and depression. Anxiety and depression as emotional and affective disorders [1,2] can impact the synthesis and release of brain neurotransmitters, consequently affecting physical function and overall quality of life [3]. Thus, implementing emotional management during the perioperative period for patients undergoing abdominal surgery holds significant importance. Traditional perioperative management, typically informed by clinical experience, tends to lack a comprehensive focus on the psychological well-being of patients both before and after surgery [4]. In addition, existing research and analysis mostly focus on the psychological management of patients with orthopedic surgery [5,6], which indicates that this method is most often considered in these specific environments. In other surgical specialties, especially abdominal surgery, the management of patients' mental health has not yet formed a systematic program [7]. This study hopes to find a clinical management model that can take into account the psychological level of patients undergoing abdominal surgery.

The Wutong mode is recognized as a prominent clinical medical research and nursing approach in "cultural transformation" of the American Academy of Nursing [8]. In 1987, a non-profit organization in the United States established the Wutong plan, which has been a pioneer in providing personalized and people-friendly care services for patients and families in hospitals [9]. The Wutong mode takes patients and their families as the specific service subjects, and the professional medical staff invite patients and their families

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to participate in the treatment of disease and the follow-up clinical activities. Operating room care based on the Wutong mode empowers patients and their families through information and education, encouraging their active involvement in nursing activities, and guiding them to form a treatment partner with medical staff and actively cooperate with treatment and nursing. This approach has demonstrated efficacy in enhancing patients' pain tolerance and reducing perioperative anxiety and tension [10]. This effect has not only been confirmed in the population of hemodialysis patients with chronic kidney disease [11], but also achieved remarkable results in liver biopsy. One study has shown that anesthesia induction with parental company under Wutong care mode can improve the induction cooperation of children, reduce the incidence of delirium during recovery, and help to accelerate the rehabilitation [12]. However, the application of operating room care based on the Wutong mode in patients undergoing abdominal surgery has not been explored. This study aims to investigate the feasibility of implementing this intervention program and provide a solid foundation and reference for enhancing anxiety, depression, and postoperative rehabilitation among patients undergoing abdominal surgery.

Subjects and Methods

Research Subjects

The study enlisted 167 patients undergoing abdominal surgery and admitted to our hospital between April 2021 and April 2023 as its research subjects. This research adhered to the principles outlined in the Declaration of Helsinki (2013) [13]. Approval for the study was obtained from the ethics committee of the Fourth Hospital of Hebei Medical University, with the assigned approval number being 2023KS094. Since this study was a retrospective analysis, patients' informed consent was not required.

Inclusion and Exclusion Criteria

Inclusion Criteria: (1) Patients who met the surgical indications for abdominal surgery [14] and underwent elective operations. (2) Patients aged between 18 and 80 years. (3) Patients with normal communication abilities who could actively cooperate with the experiment.

Exclusion Criteria: (1) Patients with pre-existing pulmonary infections or mental and behavioral abnormalities before surgery. (2) Patients with coagulation and immune dysfunction. (3) Patients with pre-existing conditions affecting the heart, liver, kidney, brain, or other organs. (4) Patients diagnosed with malignant tumors.

Research Methods

Baseline and clinical data of patients were extracted from the electronic medical record system in hospitals. This information encompassed gender, age, body mass index (BMI), disease type, education level, operation time, as well as sleep status, depression level, anxiety level, self-efficacy, and quality of life. The assessment of the latter five items was conducted through scale scores.

A. Sleep Condition: The Pittsburgh Sleep Quality Index (PSQI) score [15] was utilized to assess the sleep quality of both groups before and after the intervention, with a total score ranging from 0 to 21 points. Scores of 0–5 indicated good sleep quality, 6–10 suggested relatively good sleep quality, 11–15 represented general sleep quality, and 16–21 pointed to poor sleep quality.

B. Depression Level: The Beck Depression Inventory (BDI) scale [16] was employed to evaluate the depression status of patients after the intervention. The scale comprised a total of 13 scoring items, each adopting a 4-level scoring method ranging from 0 to 3 points, resulting in a total score range of 0–39 points. A higher score indicated more severe depression.

C. Anxiety Level: The Self-Rating Anxiety Scale (SAS) score [17] was used to assess the anxiety status of patients after the intervention, featuring a total of 20 scoring items. Each item was scored on a 1–4-point scale with four levels. The total score was then multiplied by 1.25, rounded to an integer, and presented as the standard score. A higher score reflected more severe anxiety.

D. Self-Efficacy: The General Self-Efficacy Scale-6 (GSE-6) score [18] was employed to evaluate the self-efficacy of patients before and after the intervention. The scale comprised six questions, each offering four options with a score range of 6–24 points. Scoring options included extremely inconsistent (1 point), inconsistent (2 points), consistent (3 points), and extremely consistent (4 points). A higher score indicated greater self-confidence.

E. Quality of Life: The Short-Form-36 Health Survey (SF-36) [19] was employed to assess the quality of life of patients. This scale included eight aspects: physical function (PF), role limitation due to physical health (RP), body pain (BP), general health (GH), vitality (VT), social function (SF), role limitation due to emotional problems (RE), and mental health (MH). The scoring methodology involved calculating the sum of the integrals of each item in the subscale, considering different weights for each item. The rough integral of subscales was then converted into a standard score ranging from 0 to 100 points. A higher scale score indicated better quality of life.

Grouping Methods

The study's grouping was determined by the patients' perioperative management plans. Those who underwent routine nursing during the perioperative period were assigned to the control group, while patients receiving operating room care based on the Wutong mode were included in the study group. The specific implementation details are outlined below.

Table 1. Comparison of clinical baseline characteristics in both groups.

Projects	Control group (n = 85)	Study group (n = 82)	χ^2/t	*p*
Gender			0.004	0.948
Male	40 (47.06)	39 (47.56)		
Female	45 (52.94)	43 (52.44)		
Average age (Mean ± SD, years old)	38.05 ± 10.33	38.07 ± 10.35	0.098	0.922
BMI (Mean ± SD, kg/m^2)	24.54 ± 2.99	24.68 ± 2.85	0.251	0.802
Disease types			0.165	0.983
Gastric disease	23 (27.06)	21 (25.61)		
Enteric disease	22 (25.88)	23 (28.05)		
Hepatic disease	20 (23.53)	18 (21.95)		
Pancreas disease	20 (23.53)	20 (24.39)		
Education level			0.392	0.983
Junior college and above	20 (23.53)	21 (25.61)		
Senior high school	20 (23.53)	21 (20.61)		
Junior high school	24 (28.24)	22 (26.83)		
Primary school	16 (18.82)	13 (15.85)		
Illiteracy	5 (5.88)	5 (6.10)		
Operation time (h)	6.79 ± 1.78	6.98 ± 1.62	0.579	0.564
Postoperative systolic blood pressure (mmHg)	116.89 ± 13.90	116.12 ± 15.13	–0.306	0.760
Postoperative diastolic blood pressure (mmHg)	75.12 ± 9.16	74.85 ± 9.11	–0.191	0.849
Postoperative heart rate (times/min)	115.45 ± 2.81	115.33 ± 3.45	–0.092	0.927

Notes: BMI, body mass index.

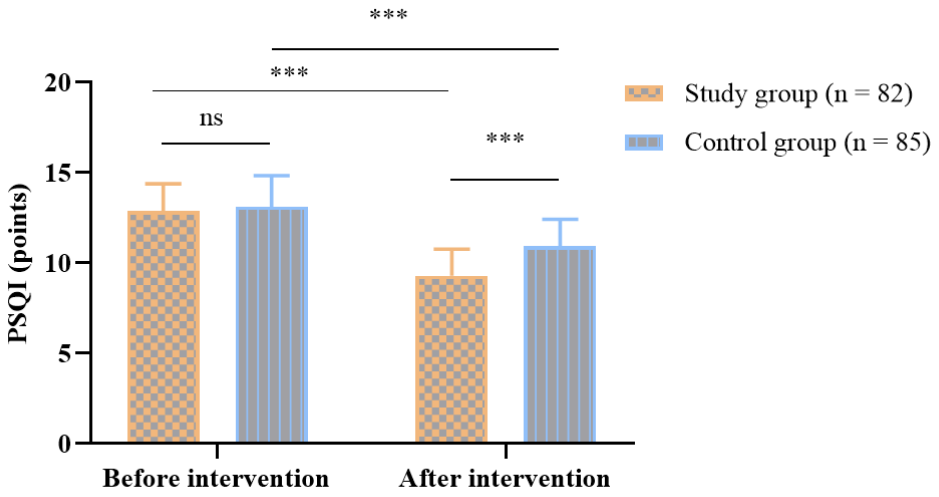

Fig. 1. Comparison of patients' sleep status in both groups before and after intervention ($\bar{x} \pm s$). Notes: The horizontal axis showed pre- and post- intervention, and the vertical axis showed Pittsburgh Sleep Quality Index (PSQI) scores. The PSQI scores of the study group before and after intervention were (12.87 ± 1.51) points and (9.29 ± 1.46) points, respectively. The PSQI scores of the control group before and after intervention were (13.11 ± 1.72) points and (10.91 ± 1.49) points, respectively. "ns" indicated that there was no marked difference in data comparison ($p > 0.05$), and "***" showed that there was a remarkable difference in data comparison ($p < 0.001$).

Routine Nursing Plan: The patients' condition was vigilantly monitored, and any abnormalities observed were promptly communicated to the medical team. Patients were provided with health guidance, including advice on balanced eating and moderate exercise. The medical staff offered essential psychological comfort and executed specific interventions such as fluid infusion, maintenance of water-electrolyte balance, and gastric decompression, aiming to facilitate the recovery of postoperative functions [20].

Table 2. Comparison of anxiety and depression between the two groups after intervention ($\bar{x} \pm s$).

Groups	n	BDI score (points)		SAS score (points)	
		Before intervention	After intervention	Before intervention	After intervention
Study group	82	21.04 ± 2.79	14.48 ± 2.92***	40.00 ± 5.16	31.06 ± 2.83***
Control group	85	21.28 ± 2.72	17.62 ± 3.04***	40.34 ± 5.15	36.59 ± 2.16***
t		–0.576	–6.822	–0.427	–14.160
p		0.565	<0.001	0.670	<0.001

Notes: "***" indicated that a significant difference existed in the comparison of data before and after intervention in the same group ($p < 0.001$); BDI, Beck Depression Inventory, SAS, Self-Rating Anxiety Scale.

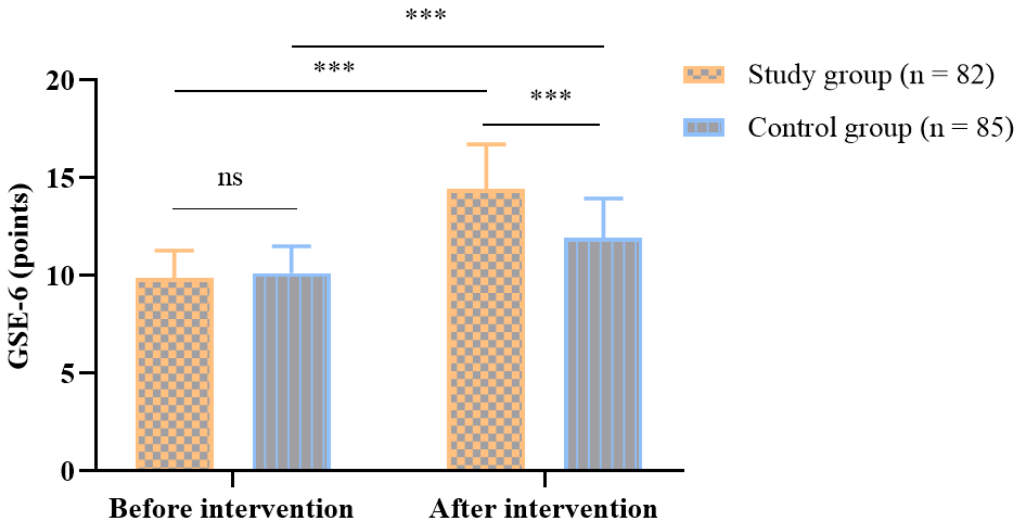

Fig. 2. Comparison of self-efficacy of patients in both groups before and after intervention ($\bar{x} \pm s$). Notes: The horizontal axis showed pre- and post- intervention, and the vertical axis showed GSE-6 scores. The GSE-6 scores of patients in the study group before and after intervention were (9.87 ± 1.39) points and (14.41 ± 2.29) points, respectively. The GSE-6 scores of patients in the control group before and after intervention were (10.13 ± 1.36) points and (11.93 ± 2.01) points, respectively. "ns" indicated that there was no overt difference in data comparison ($p > 0.05$), and "***" showed that there was a distinct difference in data comparison ($p < 0.001$); GSE-6, General Self-Efficacy Scale-6.

Operating room intervention based on Wutong mode. (1) The medical staff had standardized the operating room care process [21], implementing a comprehensive patient assessment. Detailed documentation of potential infectious factors during the perioperative period was recorded, and targeted nursing programs were formulated based on identified risk factors. These programs were then reported to the surgeons. To ensure a controlled surgical environment, it was recommended to regulate the flow of medical staff during surgery. This measure aimed to maintain a stable surgical environment and prevent bacterial floating caused by excessive air flow, ultimately reducing the risk of incision infection. Throughout the surgery, continuous monitoring of patients' vital signs, including respiration, blood pressure, heart rate, and body temperature, was carried out. In instances of hypothermia or prolonged operation times, prompt measures were taken to keep patients warm, thereby mitigating the risk of operational errors.

(2) Surgical health education began with establishing effective communication between medical staff, patients, and their families prior to surgery. This involved the implementation of systematic and standardized health education, where basic knowledge of diseases and surgical procedures was explained in accessible language. Medical staff also informed patients and their families that postoperative pain was a normal physical and psychological reaction. This information aimed to help patients maintain a positive psychological state and alleviate their fear of surgery. In addition, medical staff should provide comprehensive information on commonly used analgesic methods after surgery. This included detailing the principles, advantages, and disadvantages of these methods. It was crucial to correct any misconceptions patients may have, such as the belief that the application of analgesics delayed the rehabilitation process or that analgesics are addictive. Lastly, patients were guided to acquire self-relaxation skills for pain relief. This

Table 3. Comparison of SF-36 scores in both groups after intervention ($\bar{x} \pm s$).

Projects	Study group (n = 82)	Control group (n = 85)	z	*p*
PF	76.10 ± 4.68	72.61 ± 2.21	–5.216	<0.001
RP	76.35 ± 4.57	72.42 ± 4.43	–4.968	<0.001
BP	79.35 ± 4.51	73.53 ± 4.03	–6.875	<0.001
GH	77.96 ± 4.26	72.42 ± 3.53	–7.275	<0.001
VT	77.10 ± 5.65	69.13 ± 3.86	–7.944	<0.001
SF	79.20 ± 5.17	69.51 ± 3.54	–9.798	<0.001
RE	75.70 ± 7.43	68.79 ± 3.78	–5.972	<0.001
MH	78.45 ± 5.22	70.46 ± 4.44	–8.111	<0.001

Notes: PF, physical function; RP, role limitation due to physical health; BP, body pain; GH, general health; VT, vitality; SE, social function; RE, role limitation due to emotional problems; MH, mental health.

included effective deep breathing techniques, the reasonable redirection of patients' attention by their families, and meditation. These strategies empowered patients to actively participate in their pain management and contribute to a smoother recovery process.

(3) Patient and family participation in treatment was facilitated through unrestricted access to their own electronic medical records. This enabled patients and their families to promptly comprehend the diagnosis, treatment, and other pertinent medical information. This access allowed them to gain insight into the medical basis established by the healthcare professionals, fostering informed discussions about the disease conditions with the medical staff. By having an open channel for communication, patients and their families actively engaged in the process of diagnosis and treatment, promoting a collaborative approach to healthcare decision-making.

(4) The hospitalization environment layout [9] was tailored to accommodate patients' individual preferences and daily living conditions. Medical staff strategically arranged the ward layout to cultivate a welcoming hospital atmosphere, aiming to replicate patients' accustomed living environment. This approach served to alleviate any feelings of unfamiliarity patients may experience upon entering the hospital, fostering the establishment of a comfortable treatment atmosphere.

(5) The nursing concept of the Wutong mode was implemented through the meticulous understanding of its principles by medical staff. They gradually refined the nursing approach by adjusting specific details and formulating personalized disease service plans tailored to the unique clinical nursing requirements of each patient undergoing abdominal surgery.

Post-surgery, nurses were required to enhance their monitoring activities, placing a continued focus on patients' surgical incisions. It is imperative to strictly adhere to aseptic procedures during medication changes and maintain optimal temperature and humidity levels within the ward. Regular disinfection of the air, surfaces, and articles in the ward was conducted, and daily cleaning care was diligently administered to ensure a hygienic environment. This comprehensive approach aligns with the Wutong mode, emphasizing the importance of personalized care in the context of abdominal surgery patients.

Statistical Treatment

The data in this study were processed using SPSS 26.0 software (International Business Machines Corporation, Armonk, NY, USA), and GraphPad Prism 7 (GraphPad Software, San Diego, CA, USA) was employed for visual representation of the data. Enumeration data and measurement data were expressed as [n (%)] and ($\bar{x} \pm s$), respectively. The χ^2 test and *t*-test were applied to analyze enumeration data and measurement data, respectively. A significance level of $p < 0.05$ was considered, indicating a noteworthy difference in data between groups.

Results

Comparison of Clinical Baseline Characteristics

No significant difference existed in clinical baseline characteristics such as gender, age, and BMI between the two groups ($p > 0.05$), as shown in Table 1.

Comparison of Sleep Quality

The results indicated that there was no significant difference in patients' PSQI scores between the two groups before the intervention. However, following the intervention, the PSQI scores for both groups significantly decreased compared to pre-intervention levels ($p < 0.001$). Importantly, the study group demonstrated a significantly lower PSQI score than the control group after the intervention ($p < 0.001$), as illustrated in Fig. 1.

Comparison of Anxiety and Depression

The post-intervention BDI and SAS scores for both groups were notably lower than their respective pre-intervention scores ($p < 0.001$). Furthermore, patients in the study group exhibited significantly lower BDI and SAS scores compared to the control group after the intervention ($p < 0.001$), as outlined in Table 2.

Comparison of Self-Efficacy

After the intervention, the GSE-6 scores for both groups showed a significant increase compared to pre-intervention scores ($p < 0.001$). Notably, the study group demonstrated a significantly higher GSE-6 score than the control group after the intervention ($p < 0.001$), as illustrated in Fig. 2.

Comparison of Quality of Life

Compared with the control group, patients in the study group had significantly higher SF-36 scores after intervention ($p < 0.001$), as shown in Table 3.

Discussion

The Department of Abdominal Surgery constitutes a pivotal component of the general surgical department, encompassing a broad spectrum of aspects in its implementation. The procedures involved in abdominal surgery are inherently traumatic. Patients undergoing such treatments not only grapple with the impact of the disease itself but also bear the inherent risks associated with the surgical process. The surgical intervention, being inherently traumatic, triggers a significant stress response in patients, leading to abnormal emotional fluctuations. This emotional turbulence has the potential to adversely affect clinical prognosis and elevate the risk of postoperative complications [22,23]. Notably, a study revealed that patients undergoing laparoscopic gynecological surgery are particularly susceptible to anxiety and depression during the perioperative period, due to patients' misconceptions about the surgery and preoperative tension [24].

Implementing a music listening program during the perioperative period proves to be both feasible and well-received by patients. Consequently, the introduction of targeted interventions during this critical phase can effectively ameliorate patient anxiety and depression, ultimately fostering improved postoperative rehabilitation.

The Wutong mode, originating from overseas, represents a novel nursing concept designed to enhance patient care. This nursing approach encourages active participation from both patients and their families in clinical management, supported by safety education and information sharing. By creating a personalized, humanized, and dynamic treatment environment, the Wutong mode facilitates the genuine integration of patients' family members into the diagnosis, treatment, and nursing processes to ensure the utmost comfort and medical safety for patients [25].

Negative emotions often emerge as significant factors affecting patients' recovery, and emotions play a crucial supportive role in the healing process. A positive mindset has a beneficial impact on disease recovery, while the onset of negative emotions can impede the healing process [26]. The study's results revealed that the intervention implemented in the study group led to significantly lower BDI score ((14.48 ± 2.92) points vs (31.06 ± 2.83) points) and SAS score ((17.62 ± 3.04) points vs (36.59 ± 2.16) points) compared to the control group, indicating the effective alleviation of anxiety and depression among patients. This positive outcome can be attributed to the nursing program's patient-centered approach, granting patients and their families an active role in the care process. This collaborative approach fosters a sense of partnership between patients and medical staff, encouraging patients to actively engage in their care, bolster their confidence in practical measures, and establish a continuous atmosphere of humanistic nursing.

Professional guidance and knowledge dissemination to patients' family members are integral aspects of this nursing approach. By providing psychological support, implementing daily environmental care for patients, and fostering a supportive familial environment, the nursing program aids in diminishing negative emotions among patients [27,28].

Self-efficacy serves as a crucial indicator reflecting the comprehensive well-being of patients, encompassing psychological, physiological, and other dimensions. Given the traumatic nature of surgery, which can impact patients' quality of life, enhancing the perioperative quality of life becomes significantly meaningful in expediting postoperative rehabilitation [29]. The data from this study demonstrated that the study group exhibited a significantly higher GSE-6 score than the control group after the intervention, indicating a substantial improvement in the self-efficacy of patients undergoing the Wutong mode intervention. This improvement can be attributed to the Wutong mode's nursing intervention, which places a strong emphasis on creating a comfortable and hygienic hospitalization environment. Such an environment facilitates patients' seamless reception of hospital treatment, effectively alleviating anxiety and discomfort, and ultimately enhancing their self-efficacy [30].

However, it is important to note some limitations of this study. Due to experimental constraints, the research focused solely on patients' negative emotions and self-efficacy as observation indicators, lacking a comprehensive analysis of the intervention mode. Moreover, there was no long-term follow-up for patients. In future studies, the sample size will be expanded, and a multi-center approach will be employed for long-term patient follow-ups. This approach will enable a more comprehensive assessment of whether the intervention mode can influence other clinical indicators, laying the groundwork for widespread application and promotion of this intervention mode.

Conclusion

In summary, operating room care based on the Wutong mode has proven to be effective in alleviating anxiety and depression among patients undergoing abdominal surgery. Furthermore, it enhances their self-efficacy, thereby establishing a clinical foundation for the development and selection of subsequent perioperative nursing plans.

Availability of Data and Materials

The datasets used or analysed during the current study are available from the corresponding author on reasonable request.

Author Contributions

WJC and YC designed the research study. WJC, JCX and STW performed the research. STW analyzed the data. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study conforming to the principles of Declaration of Helsinki (2013) has been approved by the ethics committee of the Fourth Hospital of Hebei Medical University (approval No.: 2023KS094). Informed patient consent was obtained for this study.

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Conflict of Interest

The authors declare no conflict of interest.

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