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ARTICLE

Trait emotional intelligence and its impact on quality of life, anxiety, and depression in patients with gastric cancer

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Abstract

Aims/Background Trait emotional intelligence is associated with anxiety and depression symptoms and quality of life in cancer patients. However, studies on the relationship of trait emotional intelligence with anxiety, depression, and quality of life in gastric cancer patients are limited. This study investigates the relationship of trait emotional intelligence with depression and quality of life in gastric cancer patients to provide a theoretical basis for clinical management.

Methods A total of 270 patients with gastric cancer treated in our hospital from July 2020 to July 2023 were selected, of which 31 patients with missing questionnaire entries and missed visits were screened out, resulting in the enrolment of 239 gastric cancer patients in this study. In this survey, self-administered general information questionnaires, namely Trait Emotional Intelligence Short Form (TEIQue-SF), European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30), and Hospital Anxiety and Depression Scale (HADS) were used.

Results TEIQue-SF total scores were positively correlated with QLQ-C30 scores ($p < 0.001$) and negatively correlated with HADS-A and HADS-D scores ($p < 0.001$). TEIQue-SF total score was a superior positive predictor of the QLQ-C30 score ($\beta = 0.412$, $p < 0.001$) and a superior negative predictor of the HADS score ($\beta = -0.740$, $p < 0.001$). TEIQue-SF total score ($\beta = 0.141$, $p = 0.006$) and HADS score ($\beta = -0.665$, $p < 0.001$) were good predictors of QLQ-C30 score. The direct effect of TEIQue-SF total score on QLQ-C30 score was 0.141, while HADS score between TEIQue-SF total score and QLQ-C30 score had a mediated effect value of 0.492.

Conclusion Trait emotional intelligence not only directly affects the quality of life, but also indirectly affects the quality of life through anxiety and depression. Clinicians should pay attention to the anxiety, depression, and emotional intelligence of patients with gastric cancer to help them improve their quality of life.

Key words: Anxiety symptoms; Depressive symptoms; Gastric cancer; Quality of life; Trait emotional intelligence

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Introduction

The incidence of cancer is high, among which gastric cancer ranks second in the world in terms of tumour incidence and cancer mortality (Lee et al, 2017). In 2021, a study on the disease burden of gastric cancer in China from 1990 to 2019 conducted by Zhang et al (2021) showed that, the incidence rate and mortality rate of gastric cancer among Chinese residents rank first among malignant tumours, with 160,000 patients dying of gastric cancer every year, which is 4.2–7.9 times higher than that of developed countries in Europe and the United States. Gastric cancer poses a serious threat to human health, particularly in those who face mental health challenges because of the impact of the disease or the greater stress and changes in physical condition during treatment. Studies have confirmed that patients diagnosed with gastric cancer are at greater risk of developing anxiety, depression, helplessness, and even despair, as well as a series of non-adaptive behaviours (Nie et al, 2023). Anxiety and depression in patients with gastric cancer is an issue of concern worldwide, and the negative emotions of this population can exacerbate

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their response to treatment side effects and seriously affect their quality of life (Guo et al, 2023). Zhang (2021) reported that, in a survey of hospitalised gastric cancer patients, the incidence of anxiety and depression was 41.5% and 25.0%, respectively. Therefore, it is essential to identify the influencing factors of mental health problems, such as anxiety and depression, in patients with gastric cancer and to conduct early intervention to improve the quality of life of this population.

Trait emotional intelligence refers to an individual's ability to recognise, understand, and manage his or her own emotions, as well as those of others. A previous study suggested that the trait emotional intelligence is closely related to patients' mental health (Saltzman et al, 2023). Higher levels of trait emotional intelligence are associated with a lower incidence of anxiety and depression. This may be because this group of individuals is more adept at utilising effective emotion regulation strategies to cope with life's stresses and have greater immunity and ability to cope with difficulties (Osmani et al, 2023). In 2019, a study based on the French national database FREGAT of oesophageal or gastric cancer by Baudry et al revealed that cancer patients tend to modify their mood to better control the symptoms of anxiety and depression. This could limit the negative impact of surgery on their perceived health-related quality of life (HRQoL) (Baudry et al, 2019). In another study conducted in France by the same team, the results showed that emotional intelligence leads to less severe anxiety and depression and less impaired HRQoL of oesophageal and gastric cancer patients after surgery (Baudry et al, 2021). In addition, emotional competence presents a direct or an indirect beneficial effect on the satisfaction of supportive care needs, as well as anxiety and depression symptoms (Baudry et al, 2018). These studies indicate that trait emotional intelligence has a significant impact on reducing emotional distress, which affects quality of life. Therefore, it may be beneficial to consider emotional intelligence as a potential intervention for improving the health of those with cancer.

There are very few studies of gastric cancer patients as research subjects, and most studies consider trait emotional intelligence as a factor affecting behaviour or the psychological state of an individual. Furthermore, the studies are relatively homogeneous, mostly confined to the exploration of the relationship between Trait Emotional Intelligence and some specific factors, such as mental health and wellbeing. There are even fewer studies considering the combination of many factors that affect the Trait Emotional Intelligence level, especially the relationship between the Trait Emotional Intelligence level and anxiety and depression in patients with gastric cancer (Maj et al, 2023). Based on these studies, we use patients with gastric cancer as research subjects to investigate the association of trait emotional intelligence with anxiety, depression, and quality of life. This study uses questionnaires and other assessment tools to measure trait emotional intelligence, along with anxiety and depression levels, and applies quality of life-related indicators to assess the overall quality of life of gastric cancer patients for designing an intervention programme to improve the mental health of patients with gastric cancer.

Methods

Research sample

A total of 270 patients with gastric cancer treated in our hospital from July 2020 to July 2023 were selected for a cross-sectional survey. The inclusion criteria were as follows: (1) patients with gastric cancer who received diagnosis and treatment in our hospital; (2) patients aged ≥18 years old; (3) patients with normal cognitive function, ability to understand, and willingness to cooperate with the study; and (4) patients who provided written informed consent. The exclusion criteria were as follows: (1) patients with other serious physical diseases and (2) patients with a history of mental illness or consciousness disorder. Because 31 patients lacked questionnaire entries at admission and were not followed up, 239 patients with gastric cancer were finally enrolled in the study. This study was conducted with institutional ethical approval and in compliance with the Declaration of Helsinki. Written informed consent was received from each patient.

Survey method

General demographic data, anxiety and depression scores, trait emotional intelligence scores, and quality of life scores were collected by questionnaires at admission. Data collection was carried out by clinical staff according to standard guidelines so as to ensure data authenticity, accuracy, and reliability. After verification, there were no missing data in the collected questionnaires.

General demographic data: The general demographic data included age, sex, education, marital status, work status, and treatment.

Trait emotional intelligence: The Trait Emotional Intelligence Short Form (TEIQue-SF) level was used to assess the trait emotional intelligence of patients with gastric cancer (Feher et al, 2019). Based on his 'Trait-Emotional Intelligence Theory', Dr. K.v. Petridis developed the 'TEIQue SF trait-Emotional Intelligence Scale' as a 'self-reported scale', which is one of the most robust psychological assessment tools available to clinicians. The TEIQue-SF scale consists of 30 questions assessing four dimensions: well-being, self-control, emotionality, and social competence, of which well-being consists of 6 items, self-control consists of 6 items, emotionality consists of 8 items, and social competence consists of 6 items, while the remaining 4 items contribute to the overall Trait Emotional Intelligence score. Each item in the scale is rated on a 7-point scale from 'completely disagree' to 'completely agree', and the total score of the scale ranges from 30 to 210, with higher scores indicating higher trait emotional intelligence. The reliability coefficient of TEIQue SF trait emotional intelligence was 0.94, and the content validity index was 0.98.

Health-Related Quality of Life: The Quality of Life Questionnaire-Core 30 (QLQ-C30) scale is used to assess HRQoL in cancer patients (Zawisza et al, 2010). The QLQ-C3O scale is at the centre of the quality of life scale system developed by the European Organisation for Research and Treatment of Cancer (EORTC) for cancer patients. The scale consists of 30 items. It consists of five functional measures (physical function, role function, cognitive function, emotional function, social function), three symptom measures (fatigue, pain, nausea and vomiting), six personal measures (dysphagia, loss of appetite, TEIQue SF total score, constipation, diarrhoea, financial hardship), and one patient self-assessment item (total health status). Each raw score is converted to a standardised score from 0 to 100 using a linear formula. The higher the score of each functional dimension, the better the surface work state. The higher the symptom scale and individual scores, the more obvious the symptoms and the worse the quality of life. The reliability coefficient of QLQ-C30 is 0.93, and the content validity index is 0.89.

Anxiety and depression: The Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression (Smarr and Keefer, 2011). Developed by Zigmond and Smith in 1983, HADS is widely used in hospitals to screen patients for anxiety and depression. HADS is divided into 2 subscales: anxiety (HDS-A) and depression (HDS-D), with a total of 14 items: odd-numbered items indicate anxiety and even-numbered items indicate depression. Each item is rated on a 4-point scale (range: 0–3). The total score of each subscale is calculated by adding the scores of all the items in the subscale, and it ranges from 0 to 21 points. This score is positively correlated with the degree of anxiety and depression symptoms. The sensitivity and specificity of the scale are highest when the boundary value of HADS is 9, HADS > 9 is positive, and HADS < 8 is negative.

Statistical analyses

The data of patients with gastric cancer included in our study were compiled using EpiData 3.1 (Centers for Disease Control, Atlanta, GA, USA). After a logical test, the data was imported into SPSS v26.0 software (IBM Corp, Armonk, NY, USA) for data analysis. The count data were expressed as integers or percentages, and the comparison between groups was performed by x^2 test, and the rank sum test was used for ordered variables. Measurement data were expressed as mean ± standard deviation. T-test was used when the QLQ-C30 score, TEIQue-SF, and HADS score of gastric cancer patients obeyed the normal distribution.

Previous studies have suggested that emotional intelligence has direct and indirect effects on HRQoL: one is to directly affect HRQoL, and the other is to indirectly affect HRQoL by

affecting anxiety and depression symptoms (Baudry et al, 2018; Baudry et al, 2019; Baudry et al, 2021). Therefore, this study proposed two hypotheses for analysis. Hypothesis 1: Trait emotional intelligence has a direct effect on patients' anxiety and depression symptoms and HRQoL. Hypothesis 2: Trait emotional intelligence has an indirect effect on patients' HRQoL through anxiety and depression symptoms. Specifically, Pearson analysis was used to test the direct effect of TEIQue-SF on HADS score and QLQ-C30 score. Macro used bootstrapping to test the indirect effect of TEIQue-SF on QLQ-C30 scores through HADS scores. AMOS v17.0 software (IBM Corp, Armonk, NY, USA) was applied to construct structural equation modelling and the Bootstrap method was used to explore the mediating effect of HADS score between TEIQue-SF and QLQ-C30 score. Statistical significance was taken at $p < 0.05$.

Results

General demographic characteristics of patients

The age of patients with gastric cancer was 50.6 ± 2.8 years old. There were 119 males and 120 females, 98 with high school education or above, 132 that were married, and 218 that were working. In addition, there were 139 patients living in urban areas and 176 patients with TNM stage I to III. All patients had medical insurance.

Correlation analysis of trait emotional intelligence with anxiety and depression symptoms and HRQoL

The well-being, emotionality, self-control, and social competence scores, as well as TEIQue-SF total score, were significantly negatively correlated with HADS-A and HADS-D scores, and the differences were statistically significant ($p < 0.05$). The well-being, emotionality, self-control, and social competence scores, as well as TEIQue-SF total score, were significantly positively correlated with QLQ-C30 score, and the differences were statistically significant ($p < 0.05$) (Table 1).

Table 1 Correlation analysis of trait emotional intelligence with anxiety and depression symptoms and health-related quality of life (HRQoL)

TEIQue-SF		HADS-A score	HADS-D score	QLQ-C30 score
Well-being	Relevance	–0.881	–0.358	0.661
	p	<0.001	<0.001	<0.001
Emotionality	Relevance	–0.611	–0.191	0.457
	p	<0.001	0.003	<0.001
Self-control	Relevance	–0.490	–0.167	0.387
	p	<0.001	0.010	<0.001
Social competence	Relevance	–0.430	–0.149	0.390
	p	<0.001	0.021	<0.001
Holistic Trait Emotional Intelligence	Relevance	–0.421	–0.143	0.324
	p	<0.001	0.027	<0.001
Total	Relevance	–0.647	–0.225	0.473
	p	<0.001	<0.001	<0.001

Abbreviations: TEIQue-SF, Trait Emotional Intelligence Short Form; HADS, Hospital Anxiety and Depression Scale; QLQ-C30, Quality of Life Questionnaire-Core 30.

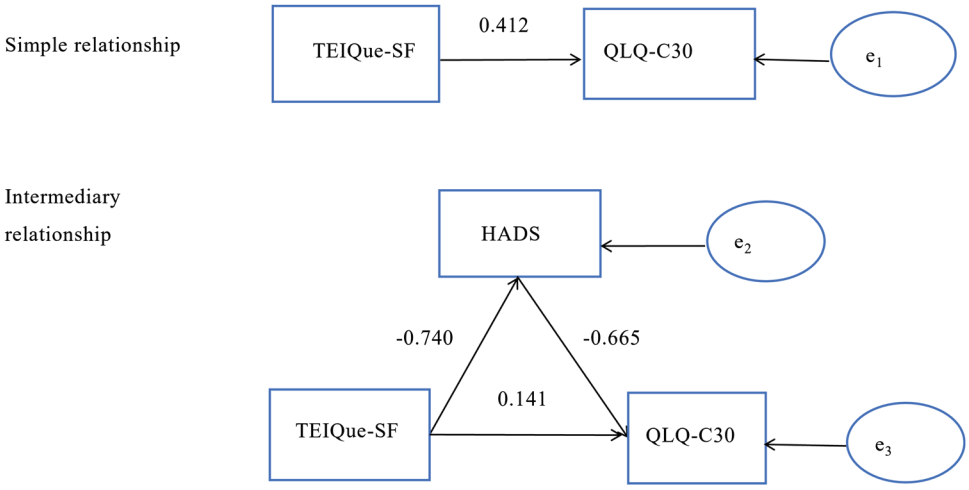

Figure 1. Diagram of the mediation effect model. TEIQue-SF, Trait Emotional Intelligence Short Form; HADS, Hospital Anxiety and Depression Scale; QLQ-C30, Quality of Life Questionnaire-Core 30.

Table 2. Mediated effects regression analysis of HADS scores

Equation	Dependent variable	Independent variable	β	Standard Error	*t*	*p*
Equation 1	QLQ-C30	TEIQue-SF	0.412	0.018	6.996	<0.001
Equation 2	HADS	TEIQue-SF	–0.740	0.042	–16.912	<0.001
Equation 3	QLQ-C30 score	TEIQue-SF	0.141	0.017	2.778	0.006
		HADS	–0.665	0.052	–13.067	<0.001

Abbreviations: TEIQue-SF, Trait Emotional Intelligence Short Form; HADS, Hospital Anxiety and Depression Scale; QLQ-C30, Quality of Life Questionnaire-Core 30.

The mediating effect of anxiety and depression symptoms on trait emotional intelligence and HRQoL

Equation 1 was established with TEIQue-SF total score as the independent variable and QLQ-C30 score as the dependent variable, and the results showed that TEIQue-SF score had a predictive effect on QLQ-C30 score ($\beta = 0.412$, $p < 0.001$). Equation 2 was established with TEIQue-SF total score as the independent variable and HADS total score as the dependent variable, and the results showed that TEIQue-SF total score had a predictive effect on HADS score ($\beta = –0.740$, $p < 0.001$). Equation 3 was established with TEIQue-SF and HADS total scores as the independent variables, and QLQ-C30 score as the dependent variable, and the results showed that HADS total score had a predictive effect on QLQ-C30 score ($\beta = –0.665$, $p < 0.001$). The effect of TEIQue-SF total score on QLQ-C30 score decreased with the addition of HADS total score (β value changed from 0.412 to 0.141). These results indicate that HADS total score has a partial mediating role between TEIQue-SF total score and QLQ-C30 score, as shown in Figure 1 and Table 2.

A structural equation model was constructed to further explore the mediating effect of HADS score between TEIQue-SF total score and QLQ-C30 score (Figure 1). The equation was established with TEIQue-SF total score as the independent variable, HADS score as the mediating variable, and QLQ-C30 score as the dependent variable. When $X^2/df < 3$, GFI > 0.9, AGFI > 0.9, CFI > 0.9, and RMESA < 0.08, the model was well fitted (Table 3).

A non-parametric percentile Bootstrap method with deviation correction was used to test the significance of the mediating effect. The test results of the Bootstrap method showed that the direct effect value of TEIQue-SF total score on QLQ-C30 score was 0.141. The 95% confidence intervals of the direct and indirect effects of TEIQue-SF total score on

Table 3. Test results of model fit index (*n*=239)

Statistical test quantity	Criteria for adaptation	Test results data	Model adaptation judgment
Value-added fit			
NFI value	>0.90	0.968	Preferably
IFI value	>0.90	0.987	Preferably
CFI value	>0.90	0.969	Preferably
Absolute fitness			
GFI	>0.90	0.935	Preferably
AGFI	>0.90	0.928	Preferably
RMSEA	<0.05 preferably, <0.08 reasonable	0.066	Preferably
Parsimony fitness index			
PCFI value	>0.50	0.610	Preferably
PNFI value	>0.50	0.618	Preferably
NC value (x^2/df)	1<x^2/df<2 preferably		
	1<x^2/<5 acceptability	2.990	Acceptability

Table 4. Comparison of mediating effects of HADS scores

Effect relationship	Path	Estimated value	Standard Error	Z-value	95%CI
Total effect		0.633	0.032	17.120	0.085–1.181
Direct effect	TEIQue-SF→QLQ-C30	0.141	0.017	2.778	0.094–0.188
Indirect effect	TEIQue-SF→HADS→QLQ-C30	0.492	0.082	2.323	0.302–0.682

Abbreviations: TEIQue-SF, Trait Emotional Intelligence Short Form; HADS, Hospital Anxiety and Depression Scale; QLQ-C30, Quality of Life Questionnaire-Core 30; 95%CI, 95% Confidence Interval.

QLQ-C30 score did not include 0, and the Z values were all greater than 1.96, indicating that the mediating effect of HADS score was significant (Table 4).

Discussion

This study explores the association of trait emotional intelligence with quality of life, anxiety, and depression symptoms in patients with gastric cancer and reports that emotional intelligence has an effect on anxiety and depression symptoms and HRQoL of gastric cancer patients. Furthermore, anxiety and depression symptoms are a possible mediating variable.

Previous research has shown that individuals with high trait emotional intelligence deal appropriately with their emotions and may have the ability to manage a variety of diseases, including kidney disease (Barberis et al, 2017), lung disease (Benzo et al, 2016), and diabetes (Schinckus et al, 2018). Sarrionandia and Mikolajczak (2020) reported that trait emotional intelligence is a significant determinant of subjective and objective health indicators, thus emphasising the importance of trait emotional intelligence in well-being.

The findings of our study demonstrated a negative correlation between the level of trait emotional intelligence of gastric cancer patients and the severity of anxiety and depression symptoms, suggesting that higher levels of trait emotional intelligence in patients were associated with lower levels of anxiety and depression. This may be attributed to trait emotional intelligence in individuals possessing superior emotional regulation, strong social support networks, excellent self-awareness and self-management skills, as well as highly effective coping strategies. These findings are consistent with those of previous studies (Zysberg et al, 2019; Chen et al, 2022). The study showed that trait emotional intelligence is significantly associated with affective disorders in patients with cancer, and this population with higher plateaued levels of trait emotional intelligence usually had fewer anxiety and depression symptoms and fewer negative emotional experiences (Chen et al, 2022). A high level of trait emotional intelligence can prevent and reduce stress and stress-induced negative emotions. Furthermore, in patients with cancer, trait emotional intelligence not only reduces negative emotions but also generates positive emotions (Zysberg et al, 2019). The presence of excessive negative emotions toward cancer may adversely affect the quality of life of cancer patients. Gastric cancer patients with high trait emotional intelligence have a greater ability to manage their emotional responses, can better cope with various challenges in their lives, and are more willing to manage negative emotions related to gastric cancer through lifestyle changes, thus reducing psychological stress and improving the patient's quality of life by decreasing tension, anxiety, and depression. The results of our study showed a positive correlation between trait emotional intelligence and quality of life in patients with gastric cancer, which was consistent with the findings of another study (Schinckus et al, 2018). This may be attributed to the fact that patients with high trait emotional intelligence do not allow personal circumstances to impact their work life, which translates into a more favourable survival experience.

The findings of our study indicate that anxiety and depression symptoms in gastric cancer patients partially mediate the relationship between trait emotional intelligence and quality of life, which is similar to the findings of other studies (Kim et al, 2021; Wei et al, 2022; Barberis et al, 2023). This provides healthcare professionals with a foundation to enhance the wellbeing of these patients. The mediation mechanism between trait emotional intelligence and quality of life, through anxiety and depression symptoms, could be elucidated as follows: A high level of trait emotional intelligence empowers patients to effectively comprehend and identify their negative emotions, thus facilitating a positive adjustment in mental state and a reduction in depressive episodes. Consequently, patients adopt a more proactive and optimistic outlook toward life, enhancing their ability to address life's challenges and improving their overall quality of life. Concurrently, individuals with elevated trait emotional intelligence typically exhibit greater self-efficacy and general satisfaction, which further augments their life quality. This study also indicated that the trait emotional intelligence directly influences the quality of life for patients. This may be due to the decline in physical function and the weaker social support network as a result of gastric cancer, which could impair patients' trait emotional intelligence, reduce their participation in daily activities and social interactions, and consequently lower their quality of life. The mediating effects of anxiety and depression reveal the mechanism through which the trait emotional intelligence impacts the quality of life of patients with gastric cancer. This suggests that healthcare professionals, family members, and other relevant departments should focus on the trait emotional intelligence levels of gastric cancer patients and offer psychological crisis intervention services, such as psychological counselling, psychoanalysis, and cognitive-behavioural therapy, to alleviate patients' psychological stress. It is also necessary to strengthen mental health education or guidance for patients, improve their psychological adaptability and adjustment skills, encourage them to face negative events with a positive and optimistic mindset, enhance their subjective well-being, and maintain their physical and mental health, ultimately improving their quality of life.

Limitations

There were some limitations in this study. First, this study was a single-centre cross-sectional study, which affected the generalisation of the research results to a certain extent.

Multicenter, long-term cohort studies are needed to further confirm the findings. Second, the questionnaire survey method used in this study may lead to self-reported bias. However, data were collected by professionals in accordance with standard guidelines, which ensures the authenticity, accuracy, and reliability of data to a certain extent. In follow-up studies, the data collection process, along with its quality control procedure, should be further strengthened. Finally, the study did not analyse the potential confounding factors that could affect the relationship between trait emotional intelligence and the findings. Future studies should include more comprehensive demographic, clinical, and psychosocial variables to account for these potential confounders in the analysis.

Conclusion

In conclusion, this study found that trait emotional intelligence can positively predict quality of life, and negatively predict anxiety and depression symptoms, while anxiety and depression symptoms have a partial mediating role between trait emotional intelligence and quality of life. This study provides a theoretical basis for future training of gastric cancer patients to improve the level of trait emotional intelligence, reduce emotional distress, and enhance mental health and quality of life. Clinicians should pay attention to the anxiety, depression, and emotional intelligence of patients with gastric cancer to help them improve their quality of life.

Key points

- TEIQue-SF total score was significantly negatively correlated with HADS-A and HADS-D scores.
- TEIQue-SF total score was significantly positively correlated with QLQ-C30 score.
- HADS total score has a partial mediating role between TEIQue-SF total score and QLQ-C30 score.
- Trait emotional intelligence not only directly affects the quality of life, but also indirectly affects the quality of life through anxiety and depression.

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Availability of data and materials

Data and materials can be obtained from the author of the communication upon reasonable request.

Author contributions

HRZ, SQS and SKH designed the study and drafted the article. HRZ and SQS independently performed the search databases. XBL contributed to the analysis and interpretation of data. All authors contributed to important 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 has been approved by the Medical Ethics Committee of Hejiang County People's Hospital. Approval No.:2024-001. Written informed consent was received from each patient.

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Conflict of interest

The authors declare no conflict of interest.

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