

# World Journal of *Gastrointestinal Surgery*

*World J Gastrointest Surg* 2023 December 27; 15(12): 2674-2961



## Contents

Monthly Volume 15 Number 12 December 27, 2023

## REVIEW

- 2674 Antimicrobial approach of abdominal post-surgical infections  
*Fiore M, Corrente A, Di Franco S, Alfieri A, Pace MC, Martora F, Petrou S, Mauriello C, Leone S*

## MINIREVIEWS

- 2693 Indocyanine green fluorescence in gastrointestinal surgery: Appraisal of current evidence  
*Kalayarasan R, Chandrasekar M, Sai Krishna P, Shanmugam D*
- 2709 Post-cholecystectomy iatrogenic bile duct injuries: Emerging role for endoscopic management  
*Emara MH, Ahmed MH, Radwan MI, Emara EH, Basheer M, Ali A, Elfert AA*

## ORIGINAL ARTICLE

## Case Control Study

- 2719 Multidisciplinary diagnosis and treatment nutritional support intervention for gastrointestinal tumor radiotherapy: Impact on nutrition and quality of life  
*Hui L, Zhang YY, Hu XD*

## Retrospective Cohort Study

- 2727 Association between the early high level of serum tacrolimus and recurrence of hepatocellular carcinoma in ABO-incompatible liver transplantation  
*Han JW, Choi JY, Jung ES, Kim JH, Cho HS, Yoo JS, Sung PS, Jang JW, Yoon SK, Choi HJ, You YK*
- 2739 Determining the need for a thoracoscopic approach to treat a giant hiatal hernia when abdominal access is poor  
*Pérez Lara FJ, Zubizarreta Jimenez R, Prieto-Puga Arjona T, Gutierrez Delgado P, Hernández Carmona JM, Hernández Gonzalez JM, Pitarch Martinez M*
- 2747 Predictive value of Hajibandeh index in determining peritoneal contamination in acute abdomen: A cohort study and meta-analysis  
*Hajibandeh S, Hajibandeh S, Evans L, Miller B, Waterman J, Ahmad SJ, Hale J, Higgi A, Johnson B, Pearce D, Helmy AH, Naguib N, Maw A*

## Retrospective Study

- 2757 Efficacy of pantoprazole plus perforation repair for peptic ulcer and its effect on the stress response  
*Leng ZY, Wang JH, Gao L, Shi K, Hua HB*
- 2765 Application of electroacupuncture in the prevention of low anterior resection syndrome after rectal cancer surgery  
*Xu LL, Xiang NJ, Cheng TC, Li YX, Chen P, Jiang ZW, Liu XX*

- 2774** Effects of remifentanyl combined with propofol on hemodynamics and oxidative stress in patients undergoing resection of rectal carcinoma  
*Huang J, Tian WJ*
- 2783** Percutaneous microwave ablation and transcatheter arterial chemoembolization for serum tumor markers and prognostics of middle-late primary hepatic carcinoma  
*Lin ZP, Huang DB, Zou XG, Chen Y, Li XQ, Zhang J*
- 2792** Novel invagination procedure for pancreaticojejunostomy using double purse string sutures: A technical note  
*Li J, Niu HY, Meng XK*
- 2799** Laparoscopic resection and endoscopic submucosal dissection for treating gastric ectopic pancreas  
*Zheng HD, Huang QY, Hu YH, Ye K, Xu JH*
- 2809** Prediction of the lymphatic, microvascular, and perineural invasion of pancreatic neuroendocrine tumors using preoperative magnetic resonance imaging  
*Liu YL, Zhu HB, Chen ML, Sun W, Li XT, Sun YS*
- 2820** Impact of hepatectomy and postoperative adjuvant transarterial chemoembolization on serum tumor markers and prognosis in intermediate-stage hepatocellular carcinoma  
*Hu YD, Zhang H, Tan W, Li ZK*

**Observational Study**

- 2831** Analysis of nutritional risk, skeletal muscle depletion, and lipid metabolism phenotype in acute radiation enteritis  
*Ma CY, Zhao J, Qian KY, Xu Z, Xu XT, Zhou JY*

**Randomized Controlled Trial**

- 2844** Holistic conditions after colon cancer: A randomized controlled trial of systematic holistic care *vs* primary care  
*Wang J, Qiao JH*

**Basic Study**

- 2855** Mutational separation and clinical outcomes of *TP53* and *CDH1* in gastric cancer  
*Liu HL, Peng H, Huang CH, Zhou HY, Ge J*
- 2866** Hepatic vagotomy blunts liver regeneration after hepatectomy by downregulating the expression of interleukin-22  
*Zhou H, Xu JL, Huang SX, He Y, He XW, Lu S, Yao B*

**META-ANALYSIS**

- 2879** Recent evidence for subcutaneous drains to prevent surgical site infections after abdominal surgery: A systematic review and meta-analysis  
*Ishinuki T, Shinkawa H, Kouzu K, Shinji S, Goda E, Ohyanagi T, Kobayashi M, Kobayashi M, Suzuki K, Kitagawa Y, Yamashita C, Mohri Y, Shimizu J, Uchino M, Haji S, Yoshida M, Ohge H, Mayumi T, Mizuguchi T*

- 2890** Prognostic role of serum carcinoembryonic antigen in patients receiving liver resection for colorectal cancer liver metastasis: A meta-analysis

*Tang F, Huang CW, Tang ZH, Lu SL, Bai T, Huang Q, Li XZ, Zhang B, Wu FX*

- 2907** Significance of carcinoembryonic antigen detection in the early diagnosis of colorectal cancer: A systematic review and meta-analysis

*Wang R, Wang Q, Li P*

### CASE REPORT

- 2919** Primary repair of esophageal atresia gross type C *via* thoracoscopic magnetic compression anastomosis: A case report

*Zhang HK, Li XQ, Song HX, Liu SQ, Wang FH, Wen J, Xiao M, Yang AP, Duan XF, Gao ZZ, Hu KL, Zhang W, Lv Y, Zhou XH, Cao ZJ*

- 2926** Portal vein embolization for closure of marked arteriportal shunt of hepatocellular carcinoma to enable radioembolization: A case report

*Wang XD, Ge NJ, Yang YF*

- 2932** Removal of a large rectal polyp with endoscopic submucosal dissection-trans-anal rectoscopic assisted minimally invasive surgery hybrid technique: A case report

*Polese L*

- 2938** Successful treatment of invasive liver abscess syndrome caused by *Klebsiella variicola* with intracranial infection and septic shock: A case report

*Zhang PJ, Lu ZH, Cao LJ, Chen H, Sun Y*

- 2945** Duodenojejunostomy treatment of groove pancreatitis-induced stenosis and obstruction of the horizontal duodenum: A case report

*Zhang Y, Cheng HH, Fan WJ*

- 2954** Awake robotic liver surgery: A case report

*Delvecchio A, Pavone G, Conticchio M, Piacente C, Varvara M, Ferraro V, Stasi M, Casella A, Filippo R, Tedeschi M, Pullano C, Inchingolo R, Delmonte V, Memeo R*

**ABOUT COVER**

Editorial Board Member of *World Journal of Gastrointestinal Surgery*, Lapo Bencini, PhD, General Surgery Unit, AOUC, Department of Oncology and Robotics, Careggi University Hospital, Florence 350134, Italy. lapbenc@tin.it

**AIMS AND SCOPE**

The primary aim of *World Journal of Gastrointestinal Surgery* (WJGS, *World J Gastrointest Surg*) is to provide scholars and readers from various fields of gastrointestinal surgery with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJGS mainly publishes articles reporting research results and findings obtained in the field of gastrointestinal surgery and covering a wide range of topics including biliary tract surgical procedures, biliopancreatic diversion, colectomy, esophagectomy, esophagostomy, pancreas transplantation, and pancreatectomy, etc.

**INDEXING/ABSTRACTING**

The WJGS is now abstracted and indexed in Science Citation Index Expanded (SCIE, also known as SciSearch®), Current Contents/Clinical Medicine, Journal Citation Reports/Science Edition, PubMed, PubMed Central, Reference Citation Analysis, China Science and Technology Journal Database, and Superstar Journals Database. The 2023 Edition of Journal Citation Reports® cites the 2022 impact factor (IF) for WJGS as 2.0; IF without journal self cites: 1.9; 5-year IF: 2.2; Journal Citation Indicator: 0.52; Ranking: 113 among 212 journals in surgery; Quartile category: Q3; Ranking: 81 among 93 journals in gastroenterology and hepatology; and Quartile category: Q4.

**RESPONSIBLE EDITORS FOR THIS ISSUE**

**Production Editor:** Rui-Rui Wu, **Production Department Director:** Xu Guo, **Editorial Office Director:** Jia-Ru Fan.

**NAME OF JOURNAL**

*World Journal of Gastrointestinal Surgery*

**ISSN**

ISSN 1948-9366 (online)

**LAUNCH DATE**

November 30, 2009

**FREQUENCY**

Monthly

**EDITORS-IN-CHIEF**

Peter Schemmer

**EDITORIAL BOARD MEMBERS**

<https://www.wjgnet.com/1948-9366/editorialboard.htm>

**PUBLICATION DATE**

December 27, 2023

**COPYRIGHT**

© 2023 Baishideng Publishing Group Inc

**INSTRUCTIONS TO AUTHORS**

<https://www.wjgnet.com/bpg/gerinfo/204>

**GUIDELINES FOR ETHICS DOCUMENTS**

<https://www.wjgnet.com/bpg/GerInfo/287>

**GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH**

<https://www.wjgnet.com/bpg/gerinfo/240>

**PUBLICATION ETHICS**

<https://www.wjgnet.com/bpg/GerInfo/288>

**PUBLICATION MISCONDUCT**

<https://www.wjgnet.com/bpg/gerinfo/208>

**ARTICLE PROCESSING CHARGE**

<https://www.wjgnet.com/bpg/gerinfo/242>

**STEPS FOR SUBMITTING MANUSCRIPTS**

<https://www.wjgnet.com/bpg/GerInfo/239>

**ONLINE SUBMISSION**

<https://www.f6publishing.com>





Case Control Study

# Multidisciplinary diagnosis and treatment nutritional support intervention for gastrointestinal tumor radiotherapy: Impact on nutrition and quality of life

Lin Hui, Ying-Ying Zhang, Xiao-Dan Hu

**Specialty type:** Gastroenterology and hepatology

**Provenance and peer review:** Unsolicited article; Externally peer reviewed.

**Peer-review model:** Single blind

**Peer-review report's scientific quality classification**

Grade A (Excellent): 0  
Grade B (Very good): 0  
Grade C (Good): C, C  
Grade D (Fair): 0  
Grade E (Poor): 0

**P-Reviewer:** Gujral A, United States; Lazaridis II, Switzerland

**Received:** August 23, 2023

**Peer-review started:** August 23, 2023

**First decision:** September 13, 2023

**Revised:** September 19, 2023

**Accepted:** November 14, 2023

**Article in press:** November 14, 2023

**Published online:** December 27, 2023



**Lin Hui**, Head, Neck and Chest Radiotherapy Department 1, Affiliated Hospital of Jiangnan University, Wuxi 214000, Jiangsu Province, China

**Ying-Ying Zhang**, Department of Gastroenterology, The People's Hospital of Danyang, Danyang 212300, Jiangsu Province, China

**Xiao-Dan Hu**, Department of Gastroenterology, Affiliated Hospital of Jiangnan University, Wuxi 214000, Jiangsu Province, China

**Corresponding author:** Xiao-Dan Hu, MMed, Master's Student, Department of Gastroenterology, Affiliated Hospital of Jiangnan University, No. 1000 Hefeng Road, Binhu District, Wuxi 214000, Jiangsu Province, China. [258636904@qq.com](mailto:258636904@qq.com)

## Abstract

### BACKGROUND

Gastrointestinal tumors are a major cause of cancer-related deaths and have become a major public health problem. This study aims to provide a scientific basis for improving clinical treatment effects, quality of life, and prognosis of patients with gastrointestinal tumors.

### AIM

To explore the clinical effect of the multidisciplinary diagnosis and treatment (MDT) nutrition intervention model on patients with gastrointestinal tumors.

### METHODS

This was a case control study which included patients with gastrointestinal tumors who received radiotherapy at the Department of Oncology between January 2021 and January 2023. Using a random number table, 120 patients were randomly divided into MDT and control groups with 60 patients in each group. To analyze the effect of MDT on the nutritional status and quality of life of the patients, the nutritional status and quality of life scores of the patients were measured before and after the treatment.

### RESULTS

Albumin (ALB), transferrin (TRF), hemoglobin (Hb), and total protein (TP) levels significantly decreased after the treatment. The control group had significantly

lower ALB, TRF, Hb, and TP levels than the MDT group, and the differences in these levels between the two groups were statistically significant ( $P < 0.05$ ). After the treatment, the MDT group had significantly more well-nourished patients than the control group ( $P < 0.05$ ). The quality of life total score, somatic functioning, role functioning, and emotional functioning were higher in the MDT group than in the control group. By contrast, pain, fatigue, nausea, and vomiting scores were lower in the MDT group than in the control group ( $P < 0.05$ ).

## CONCLUSION

MDT nutritional intervention model effectively improves the nutritional status and quality of life of the patients. The study provides a rigorous theoretical basis for improving the prognosis of cancer patients. In the future, we intend to provide additional treatment methods for improving the quality of life of patients with cancer.

**Key Words:** Nutritional support; Gastrointestinal tumor; Radiotherapy; Nutrition; Quality of life; Multidisciplinary diagnosis and treatment intervention

©The Author(s) 2023. Published by Baishideng Publishing Group Inc. All rights reserved.

**Core Tip:** The multidisciplinary diagnosis and treatment nutritional intervention model significantly improved the nutritional status and quality of life of patients with gastrointestinal tumors undergoing radiotherapy. This study provides evidence for the implementation of comprehensive nutritional support strategies to enhance treatment outcomes and patient well-being.

**Citation:** Hui L, Zhang YY, Hu XD. Multidisciplinary diagnosis and treatment nutritional support intervention for gastrointestinal tumor radiotherapy: Impact on nutrition and quality of life. *World J Gastrointest Surg* 2023; 15(12): 2719-2726

**URL:** <https://www.wjgnet.com/1948-9366/full/v15/i12/2719.htm>

**DOI:** <https://dx.doi.org/10.4240/wjgs.v15.i12.2719>

## INTRODUCTION

Gastrointestinal tumors contribute to a significant proportion of cancer-related deaths, mainly gastrointestinal cancers such as esophageal, gastric, colon, and rectal cancers[1]. The 2020 WHO data revealed that colorectal and stomach cancers are the third and fifth most prevalent cancers[2]. Therefore, the treatment and prognosis of gastrointestinal tumors remain a current healthcare concern. Most patients undergoing radiotherapy for the digestive tract experience malnutrition[3]. Because of the effects of chemotherapy, most patients experience nausea, vomiting, appetite loss, and other clinical symptoms during treatment, which further aggravate appetite loss in patients[4-6]. Malnutrition may also aggravate the risk of toxic reactions, affecting the patient's clinical outcome, which in turn affects the quality of life and survival prognosis of the patients[1,7].

Multidisciplinary diagnosis and treatment (MDT) refers to a patient-centered, multidisciplinary, team-based, and comprehensive intervention and treatment plan for a particular disease. MDT is of remarkable significance for the clinical diagnosis and prognosis of malignant tumors[8]. An MDT concept-based personalized care model is effective for the clinical treatment of breast cancer. It improves the patients' quality of life and alleviates anxiety and depression[9]. The MDT model has been considered the preferred treatment modality for patients with laryngeal cancer[10]. Recent studies have shown that MDT can also be better applied in gastrointestinal cancers. For example, a previous meta-analysis concluded that the clinical therapeutic effect of MDT depends on the tumor type and disease stage. MDT has the most significant clinical therapeutic effect in patients with low-stage tumors. However, studies investigating the effects of MDT in patients with gastrointestinal tumors who are receiving radiotherapy are rare. Most of these studies have only focused on the effect of treatment in the perioperative period of patients with gastrointestinal tumors, whereas those focusing on the radiotherapy period are fewer.

Based on previous studies, the present study adopted the MDT nutritional intervention model as nutritional adjuvant therapy for patients with gastrointestinal tumors undergoing radiotherapy. In this case-control study, 120 patients receiving radiotherapy were included as study participants to explore the clinical effects of the MDT nutritional support intervention model on their nutritional status and quality of life of the patients. Thus, this study provides a scientific basis for improving clinical treatment effects, quality of life, and prognosis of patients with gastrointestinal tumors.

## MATERIALS AND METHODS

### Research participant

The study participants included patients with gastrointestinal tumors who underwent radiotherapy in the Department of Oncology between January 2021 and January 2023. Using a random number table, 120 study participants were randomly divided into the MDT and control groups (each group: 60 participants).

Patients: (1) Aged > 18 years; (2) clinically diagnosed as having digestive tract tumors on the basis of the diagnostic criteria; (3) who met the criteria for chemotherapy treatment, as determined by two attending physicians; and (4) who gave consent to the research project by signing an informed consent form were included in the study. Written informed consent was also obtained from the patient families.

Patients: (1) With cognitive impairment, psychiatric disorders, and an inability to provide clear answers; (2) allergic to nutritional drugs; (3) having a combination of severe hepatic and renal diseases; (4) having a combination of tumors in other systems; and (5) who could not undergo follow-up observation were excluded from the study.

### Research design

The MDT for digestive system tumors at our hospital was discussed with all the patients, and a radiotherapy plan was formulated. The need for concurrent chemotherapy and radiotherapy was determined based on the patient's age, tumor type, underlying disease status, and physical strength score. The chemotherapy regimen included 850-1250 mg/m<sup>2</sup> capecitabine administered orally twice daily on days 1-14, which was repeated every 3 wk for 8 cycles. Based on tumor type and stage, three methods of external irradiation, intracavitary, and combined radiotherapy were selected.

In the MDT group, the MDT nutritional support model was used as an intervention to improve the patients' nutritional status. (1) An MDT team comprising a nurse manager, two oncology specialist nurses, two gastrointestinal oncologists, nutritionist, pharmacist, and behavioral interventionist was formed. Before the study commencement, a nutritional assessment was conducted by a dietitian to determine the patient's nutritional status and developed a nutritional program. Patients who could not intake oral nutritional agents after the assessment were provided with nutrition through a gastric tube. Specialist nurses dispensed daily medications and instructed the family members to implement nutritional interventions for the patients. The pharmacist managed the patient's medication, and the behavioral interventionist provided psychological and behavioral interventions; (2) During radiotherapy, the patients underwent weekly nutritional assessment for 12 wk, that is, three treatment cycles. The patients received a daily nutritional intake of 20-35 kcal/kg, and the daily consumption of the three major nutrients was 1.2-2.0 g/kg for protein, 1.0-1.3 g/kg for fat, and 3.0-5.0 g/kg for carbohydrates. Meanwhile, the dietitian monitored and recorded the patient's body mass index and nutritional scores, as well as the presence of metabolic diseases such as diabetes and hyperlipidemia, to adjust the nutritional preparations; and (3) The MDT nutritional intervention was maintained for at least 3 mo after radiotherapy, depending on the patient's weight, nutritional score, response to radiotherapy, and the presence of diabetes.

The control group did not receive guidance from professional dietitians, and an MDT team was not formed for this group to formulate a systematic nutritional support program. During hospitalization, the attending physician was responsible for the daily diet and nutritional plan for the control group, and if the patients were judged unable to eat on their own, they were administered a short-term intravenous nutrient drip.

### Nutritional status assessment

Nutritional status was assessed using the 2002 Nutritional Risk Screening (NRS) and Patient-Generated Subjective Global Assessment (PG-SGA) scales. The NRS scale consists of four parts: (1) Basic nutritional information of the patient including height, weight, and albumin (ALB), transferrin (TRF), hemoglobin (Hb), and total protein (TP) levels; (2) a score of the patient's disease status; (3) a score of the patient's nutritional status; and (4) a score of the patient's age. A defined score of > 3 was considered a nutritional risk, and nutritional intervention was deemed necessary. The PG-SGA scale consists of three grades (A, B, and C) based on which patients self-assess their nutritional status. The indicators of assessment include recent weight changes, dietary changes, gastrointestinal symptoms, changes in mobility, stress response, muscle wasting, triceps skinfold thickness, and ankle edema. Based on the overall scale score, three grades existed: nutritional status A = 0-1, representing good nutritional status; nutritional status B = 2-8, representing mild/moderate malnourishment; and nutritional status C > 9, representing severe malnourishment.

### Quality of life assessment

The quality of life of the patients was assessed using The European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30 (version 3) quality of life questionnaire developed by the EORTC. The EORTC QLQ-C30 scale has been used to measure the quality of life of cancer patients in several European countries and regions. The scale consists of three dimensions, namely the symptom scale, functioning scale, and overall quality of life, with a total of 30 items. The higher the score, the worse the patient's quality of life.

### Statistical analysis

Data were statistically analyzed using the SPSS software (version 26.0). Continuous data were normally distributed and presented as means and percentages. The median (interquartile range) was used to describe continuous variables with skewed distributions, and categorical variables were presented as numbers and percentages (%). Differences in quantitative data between the two groups were analyzed using *t*-tests. Multiple groups of data were analyzed using the chi-squared test. All analyses were performed with a test level of  $\alpha = 0.05$ , and differences were considered statistically significant at  $P < 0.05$ .



## RESULTS

### Participant characteristics

The statistical analysis of the basic patient information revealed no statistical differences between the two groups in terms of sex, age, degree of tumor differentiation, number of simultaneous chemotherapy treatments, tumor type, and lymph node metastasis before receiving the treatment ( $P > 0.05$ ; Table 1).

### Nutritional status assessment

The analysis compared ALB, TP, Hb, and TRF levels in the two patient groups before and after treatment. No significant difference was observed between the two patient groups before the treatment ( $P > 0.05$ ). The ALB, TRF, Hb, and TP levels significantly decreased after eight weeks of treatment. The control group had significantly lower ALB, TRF, Hb, and TP levels than the MDT group, and the differences in these levels between the two groups were statistically significant ( $P < 0.05$ ; Tables 2 and 3).

Autonomous scoring of patients' nutritional status before and after the treatment revealed no significant difference in the PG-SGA nutritional status between the MDT and control groups before the treatment ( $P > 0.05$ ). By contrast, after the treatment, the MDT group had significantly more well-nourished patients than the control group ( $P < 0.05$ ; Table 4).

### Quality of life assessment

Table 5 presents the difference in the quality of life scores between the two groups before and after the treatment. No significant difference was observed in each score between the two groups before the treatment ( $P > 0.05$ ). After the treatment, the quality of life total score, somatic functioning, role functioning, and emotional functioning were higher in the MDT group than in the control group. By contrast, pain, fatigue, nausea, and vomiting scores were lower in the MDT group than in the control group ( $P < 0.05$ ).

## DISCUSSION

In our study, the MDT nutritional intervention model was effective in improving the nutritional indicators in patients with digestive tumors. It improved several functional indicators of quality of life, including somatic functioning, and reduced several symptom scores such as pain.

### Nutritional status

Patients with cancer often tend to lose their appetite and exhibit a decline in nutritional status when receiving treatment. Nutritional interventions for patients with cancer has been found to have a huge impact on their therapeutic effect and quality of life[11,12]. The efficacy of the MDT model in the clinical management of patients with cancer has been demonstrated in several studies[13,14]. Findlay reported that the MDT nutritional support model plays a significant role in the clinical management of head and neck cancer, and that MDT intervention can provide optimal nutritional care for patients with cancer[14]. These results were confirmed in the present study. ALB, TRF, TP, and Hb levels are crucial indicators of nutritional status. After the patients received radiotherapy, these indicators exhibited a decreasing trend in both the MDT and control groups. However, after the treatment, a significant difference was observed between the two groups. The levels of these indicators were higher in the MDT group than in the control group. Autonomous scoring using the PG-SGA revealed higher scores in the MDT group than in the control group. The MDT nutritional intervention model involves intervention by a professional dietitian and a personalized program based on the patient's condition. This model ensures that a patient's nutritional intake is adjusted according to their underlying disease.

### Quality of life

Few studies have focused on the impact of the MDT model on the quality of life of patients with gastrointestinal tumors [15,16]. By using the MDT model in the clinical treatment of lung disease, a previous study explored its impact on the quality of life. The MDT model was found to improve the prognosis and quality of life of the patients and slow disease progression. In our study, the MDT nutritional support model could improve several life functions, including somatic, role, and emotional functions. It could effectively improve pain, fatigue, nausea, and vomiting, which are the complications of radiotherapy. Cancer is considered to negatively affect the quality of life of patients and is affected by the treatment length and disease duration[17-19]. However, the MDT model can improve the quality of life and regulate the mental health of patients with gastrointestinal cancer. The MDT model involves the participation of physicians and nursing staff from multiple disciplines and comprehensively considers the quality of life of patients undergoing radiotherapy. Studies have also reported on the advantages of MDT. MDT can effectively improve the survival outcome of patients with metastatic renal cell carcinoma, and can prolong the survival of patients with metastatic prostate cancer [20].

### Strengths and limitations

The strengths of this study lie in its prospective nature, which allowed observation of the changes in the quality of life and nutritional levels of patients during treatment, as well as in the comparative analyses conducted to observe the exact clinical effects of MDT. However, we could not use a large sample size in this study because of strict screening conditions for the study population. A large-scale study is required to confirm the validity of these findings.

**Table 1 Characteristics of participants**

| Items                                |                         | MDT group (n = 60) | Control group (n = 60) | Statistical value | P value |
|--------------------------------------|-------------------------|--------------------|------------------------|-------------------|---------|
| Age (yr)                             | ≤ 65                    | 55.58 ± 1.09       | 53.66 ± 1.05           | 1.272             | 0.209   |
|                                      | > 65                    | 73.48 ± 0.77       | 73.62 ± 0.86           | 0.119             | 0.996   |
| Sex                                  | Male                    | 14                 | 16                     | 0.067             | 0.796   |
|                                      | Female                  | 15                 | 15                     |                   |         |
| Simultaneous chemotherapy treatments | Yes                     | 11                 | 12                     | 0.071             | 0.791   |
|                                      | No                      | 19                 | 18                     |                   |         |
| Tumor type                           | Stomach cancer          | 5                  | 6                      | 0.292             | 0.962   |
|                                      | Cancer of the esophagus | 7                  | 8                      |                   |         |
|                                      | Intestinal cancer       | 12                 | 11                     |                   |         |
|                                      | Other cancer            | 6                  | 5                      |                   |         |
| Lymph node metastasis                | Yes                     | 14                 | 13                     | 0.067             | 0.795   |
|                                      | No                      | 16                 | 17                     |                   |         |

MDT: Multidisciplinary diagnosis and treatment.

**Table 2 Differences between the multidisciplinary diagnosis and treatment and control groups in albumin/total protein**

|               | ALB          |                           | TP           |                           |
|---------------|--------------|---------------------------|--------------|---------------------------|
|               | Before       | After                     | Before       | After                     |
| MDT group     | 39.83 ± 0.55 | 34.74 ± 0.48 <sup>a</sup> | 66.77 ± 0.93 | 62.16 ± 0.70 <sup>a</sup> |
| Control group | 39.65 ± 0.44 | 37.14 ± 0.52 <sup>a</sup> | 67.66 ± 0.82 | 66.10 ± 1.00 <sup>a</sup> |
| H/t           | -0.134       | 3.066                     | 0.705        | 3.021                     |
| P value       | 0.893        | 0.002                     | 0.481        | 0.003                     |

<sup>a</sup>P < 0.05, difference compared with that before treatment.

ALB: Albumin; TP: Total protein; MDT: Multidisciplinary diagnosis and treatment.

**Table 3 Differences between multidisciplinary diagnosis and treatment and control groups in transferrin/hemoglobin**

|               | TRF           |                           | Hb            |                            |
|---------------|---------------|---------------------------|---------------|----------------------------|
|               | Before        | After                     | Before        | After                      |
| MDT group     | 275.29 ± 2.03 | 34.74 ± 0.48 <sup>a</sup> | 139.51 ± 1.10 | 121.68 ± 1.12 <sup>a</sup> |
| Control group | 271.27 ± 0.44 | 37.14 ± 0.52 <sup>a</sup> | 137.55 ± 1.11 | 130.83 ± 1.55 <sup>a</sup> |
| H             | -1.066        | 2.569                     | -1.148        | 3.867                      |
| P value       | 0.286         | 0.010                     | 0.251         | 0.000                      |

<sup>a</sup>P < 0.05, difference compared with that before treatment.

TRF: Transferrin; Hb: Hemoglobin; MDT: Multidisciplinary diagnosis and treatment.

## CONCLUSION

This case-control study explored the clinical effects of the MDT nutritional intervention model in patients with gastrointestinal tumors who were undergoing radiotherapy. The MDT nutritional intervention model could effectively improve the nutritional status and quality of life of the patients. The study findings provide a rigorous theoretical basis for improving the prognosis of patients with cancer. In the future, we intend to provide additional treatment methods for improving the quality of life of patients with cancer.

**Table 4** The difference in the Patient-Generated Subjective Global Assessment score compared between the multidisciplinary diagnosis and treatment and control groups before and after treatment

|               | Before PG-SGA  |              | After PG-SGA   |              |
|---------------|----------------|--------------|----------------|--------------|
|               | Well-nourished | Malnourished | Well-nourished | Malnourished |
| MDT group     | 7              | 23           | 13             | 17           |
| Control group | 8              | 22           | 4              | 26           |
| Z             |                | 0.089        |                | 6.648        |
| P value       |                | 0.766        |                | 0.010        |

Before Patient-Generated Subjective Global Assessment (PG-SGA) refers to before-patient treatment; after PG-SGA refers to after-patient treatment. PG-SGA: Patient-Generated Subjective Global Assessment; MDT: Multidisciplinary diagnosis and treatment.

**Table 5** Quality of life difference between the multidisciplinary diagnosis and treatment and control groups

|                           |        | MDT group    | Control group | H/t    | P value |
|---------------------------|--------|--------------|---------------|--------|---------|
| Total score               | Before | 29.57 ± 0.59 | 30.53 ± 0.57  | 1.259  | 0.208   |
|                           | After  | 47.90 ± 1.37 | 40.30 ± 1.03  | 3.814  | 0.000   |
| Functional scale          |        |              |               |        |         |
| Somatic function          | Before | 68.96 ± 0.68 | 67.87 ± 1.40  | -0.126 | 0.900   |
|                           | After  | 83.23 ± 0.58 | 77.40 ± 0.96  | 4.057  | 0.000   |
| Role function             | Before | 62.06 ± 1.74 | 59.93 ± 0.74  | -0.051 | 0.959   |
|                           | After  | 72.77 ± 1.01 | 69.03 ± 1.32  | 2.245  | 0.025   |
| Emotional function        | Before | 47.87 ± 0.78 | 46.60 ± 0.67  | 1.235  | 0.222   |
|                           | After  | 67.03 ± 1.11 | 55.63 ± 0.87  | 5.729  | 0.000   |
| Cognitive function        | Before | 49.56 ± 0.35 | 49.07 ± 0.31  | -1.205 | 0.228   |
|                           | After  | 65.27 ± 1.21 | 62.90 ± 1.09  | 1.37   | 0.168   |
| Social function           | Before | 53.53 ± 0.99 | 52.10 ± 0.88  | -1.052 | 0.293   |
|                           | After  | 63.13 ± 1.16 | 62.67 ± 1.04  | 0.393  | 0.695   |
| Symptom scale             |        |              |               |        |         |
| Pain score                | Before | 69.93 ± 1.72 | 73.23 ± 1.67  | 1.442  | 0.149   |
|                           | After  | 51.80 ± 1.35 | 64.33 ± 1.91  | -4.492 | 0.000   |
| Fatigue score             | Before | 73.63 ± 1.47 | 72.10 ± 1.28  | 1.220  | 0.204   |
|                           | After  | 47.53 ± 1.58 | 52.70 ± 1.40  | -2.020 | 0.043   |
| Nausea and vomiting score | Before | 54.16 ± 0.95 | 55.53 ± 0.82  | 1.246  | 0.213   |
|                           | After  | 34.57 ± 0.51 | 45.97 ± 1.29  | 8.193  | 0.000   |

MDT: Multidisciplinary diagnosis and treatment.

## ARTICLE HIGHLIGHTS

### Research background

Gastrointestinal tumors account for a significant proportion of deaths from cancer-related diseases, and malnutrition aggravates the probability of toxic reactions, affecting the clinical outcome of patients and ultimately affecting their quality of life and survival prognosis. Multidisciplinary diagnosis and treatment (MDT) refers to a patient-centered, multidisciplinary, team-based, comprehensive intervention and treatment plan for a particular disease, and previous studies have shown that MDT has a good clinical effect on the quality of life and nutritional status of patients.

**Research motivation**

This study provides a scientific basis for improving the clinical treatment effects, quality of life, and prognosis of patients with gastrointestinal tumors.

**Research objectives**

To explore the clinical effect of the MDT nutrition intervention model on patients with gastrointestinal tumors.

**Research methods**

Study participants were selected from among patients with gastrointestinal tumors who underwent chemotherapy in the Department of Oncology between January 2021 and January 2023. Patients were grouped using a random number table. A total of 120 study participants were randomly divided into MDT and control groups, with 60 study participants in each group. To analyze the effects of MDT on the nutritional status and quality of life of patients undergoing radiotherapy for gastrointestinal tumors by measuring their nutritional status and quality of life scores before and after treatment.

**Research results**

There was a significant decrease in the levels of albumin, transferrin, hemoglobin, and total protein after treatment, and the control group had significantly lower levels than the MDT group, and the difference between the two groups was statistically significant ( $P < 0.05$ ). However, after treatment, there were significantly more well-nourished patients in the MDT group than in the control group ( $P < 0.05$ ). The total quality of life score, somatic functioning, role functioning, and emotional functioning in the MDT group were higher than those in the control group, and the pain, fatigue, nausea, and vomiting scores in the MDT group were lower than those in the control group ( $P < 0.05$ ).

**Research conclusions**

This case-control study was conducted to explore the clinical effects of the MDT nutritional intervention model on patients undergoing gastrointestinal tumor radiotherapy. The results showed that the MDT nutritional intervention model effectively improved the nutritional status and quality of life of patients.

**Research perspectives**

Future research should provide alternative treatment methods to improve the clinical quality of patients with cancer.

---

**FOOTNOTES**

---

**Co-first authors:** Lin Hui and Ying-Ying Zhang.

**Author contributions:** In this study, Hui L and Zhang YY made equal contributions as co first authors; Hu XD was designated as the corresponding author and assumed primary responsibility.

**Institutional review board statement:** This study was reviewed and approved by the Institutional Review Board of Affiliated Hospital of Jiangnan University.

**Informed consent statement:** All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

**Conflict-of-interest statement:** The authors declare no conflicts of interest for this article.

**Data sharing statement:** No additional data are available.

**STROBE statement:** The authors have read the STROBE Statement—checklist of items, and the manuscript was prepared and revised according to the STROBE Statement—checklist of items.

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

**Country/Territory of origin:** China

**ORCID number:** Lin Hui 0009-0004-7569-2504; Xiao-Dan Hu 0009-0003-1967-446X.

**S-Editor:** Yan JP

**L-Editor:** A

**P-Editor:** Yu HG

## REFERENCES

- 1 **Cao W**, Chen HD, Yu YW, Li N, Chen WQ. Changing profiles of cancer burden worldwide and in China: a secondary analysis of the global cancer statistics 2020. *Chin Med J (Engl)* 2021; **134**: 783-791 [PMID: [33734139](#) DOI: [10.1097/CM9.0000000000001474](#)]
- 2 **Pillay B**, Wootten AC, Crowe H, Corcoran N, Tran B, Bowden P, Crowe J, Costello AJ. The impact of multidisciplinary team meetings on patient assessment, management and outcomes in oncology settings: A systematic review of the literature. *Cancer Treat Rev* 2016; **42**: 56-72 [PMID: [26643552](#) DOI: [10.1016/j.ctrv.2015.11.007](#)]
- 3 **Feeney G**, Sehgal R, Sheehan M, Hogan A, Regan M, Joyce M, Kerin M. Neoadjuvant radiotherapy for rectal cancer management. *World J Gastroenterol* 2019; **25**: 4850-4869 [PMID: [31543678](#) DOI: [10.3748/wjg.v25.i33.4850](#)]
- 4 **Chen ZY**. [Application of perioperative chemotherapy in locally advanced colorectal cancer]. *Zhonghua Wei Chang Wai Ke Za Zhi* 2019; **22**: 387-391 [PMID: [31054554](#) DOI: [10.3760/cma.j.issn.1671-0274.2019.04.014](#)]
- 5 **Le HJ**, Chen SY, Li Y, Xu Y, Lei WB. [The progress on diagnosis and treatment of larynx cancer]. *Lin Chuang Er Bi Yan Hou Tou Jing Wai Ke Za Zhi* 2019; **33**: 1017-1021 [PMID: [31914285](#) DOI: [10.13201/j.issn.1001-1781.2019.11.003](#)]
- 6 **Ryan AM**, Power DG, Daly L, Cushen SJ, Ni Bhuachalla E, Prado CM. Cancer-associated malnutrition, cachexia and sarcopenia: the skeleton in the hospital closet 40 years later. *Proc Nutr Soc* 2016; **75**: 199-211 [PMID: [26786393](#) DOI: [10.1017/S002966511500419X](#)]
- 7 **Deftereos I**, Yeung JMC, Arslan J, Carter VM, Isenring E, Kiss N; On Behalf Of The Nourish Point Prevalence Study Group. Assessment of Nutritional Status and Nutrition Impact Symptoms in Patients Undergoing Resection for Upper Gastrointestinal Cancer: Results from the Multi-Centre NOURISH Point Prevalence Study. *Nutrients* 2021; **13** [PMID: [34684353](#) DOI: [10.3390/nu13103349](#)]
- 8 **Chen Y**, Luo F, Shi G. To Study the Effect of Individualized Nursing Model Based on MDT Concept on Limb Function Recovery and Quality of Life in Patients with Breast Cancer. *Comput Math Methods Med* 2022; **2022**: 1032503 [PMID: [36118838](#) DOI: [10.1155/2022/1032503](#)]
- 9 **Barreira JV**. The Role of Nutrition in Cancer Patients. *Nutr Cancer* 2021; **73**: 2849-2850 [PMID: [33108908](#) DOI: [10.1080/01635581.2020.1839519](#)]
- 10 **Hissong E**, Graham RP, Wen KW, Alpert L, Shi J, Lamps LW. Adenomatoid tumours of the gastrointestinal tract - a case-series and review of the literature. *Histopathology* 2022; **80**: 348-359 [PMID: [34480486](#) DOI: [10.1111/his.14553](#)]
- 11 **Deftereos I**, Kiss N, Isenring E, Carter VM, Yeung JM. A systematic review of the effect of preoperative nutrition support on nutritional status and treatment outcomes in upper gastrointestinal cancer resection. *Eur J Surg Oncol* 2020; **46**: 1423-1434 [PMID: [32336624](#) DOI: [10.1016/j.ejso.2020.04.008](#)]
- 12 **Bossi P**, Delrio P, Mascheroni A, Zanetti M. The Spectrum of Malnutrition/Cachexia/Sarcopenia in Oncology According to Different Cancer Types and Settings: A Narrative Review. *Nutrients* 2021; **13** [PMID: [34207529](#) DOI: [10.3390/nu13061980](#)]
- 13 **Prgomert D**, Bišof V, Prstačić R, Curić Radivojević R, Brajković L, Šimić I. The multidisciplinary team (mdt) in the treatment of head and neck cancer-A single-institution experience. *Acta Clin Croat* 2022; **61**: 77-87 [PMID: [37250663](#) DOI: [10.20471/acc.2022.61.s4.10](#)]
- 14 **Findlay M**, Bauer J, Shaw T, White K, Lai M, Rankin NM. "There's a lot of talent in the room but it's only really the medical talent that gets heard": a qualitative exploration of multidisciplinary clinicians' perspectives of optimal nutrition care of patients with head and neck cancer. *Support Care Cancer* 2021; **29**: 6399-6409 [PMID: [33890164](#) DOI: [10.1007/s00520-021-06162-4](#)]
- 15 **Lahiri M**, Cheung PPM, Dhanasekaran P, Wong SR, Yap A, Tan DSH, Chong SH, Tan CH, Santosa A, Phan P. Evaluation of a multidisciplinary care model to improve quality of life in rheumatoid arthritis: a randomised controlled trial. *Qual Life Res* 2022; **31**: 1749-1759 [PMID: [34741249](#) DOI: [10.1007/s11136-021-03029-3](#)]
- 16 **Liu L**, Hui K. Multidisciplinary diagnosis and treatment model based on a retrospective cohort study: Pulmonary function and prognosis quality of life in severe COPD. *Technol Health Care* 2023 [PMID: [37125590](#) DOI: [10.3233/THC-230159](#)]
- 17 **Jacobs JM**, Ream ME, Pensak N, Nisotel LE, Fishbein JN, MacDonald JJ, Buzaglo J, Lennes IT, Safren SA, Pirl WF, Temel JS, Greer JA. Patient Experiences With Oral Chemotherapy: Adherence, Symptoms, and Quality of Life. *J Natl Compr Canc Netw* 2019; **17**: 221-228 [PMID: [30865917](#) DOI: [10.6004/jnccn.2018.7098](#)]
- 18 **Zhang X**, Zhang D, Yu P, Li X. Effects of Continuous Care Combined with Evidence-Based Nursing on Mental Status and Quality of Life and Self-Care Ability in Patients with Liver from Breast Cancer: A Single-Center Randomized Controlled Study. *Comput Math Methods Med* 2022; **2022**: 3637792 [PMID: [35529261](#) DOI: [10.1155/2022/3637792](#)]
- 19 **Zeng Y**, Zhu S, Wang Z, Chen J, Dai J, Liu Z, Sun G, Liang J, Zhang X, Zhao J, Ni Y, Yang J, Wang M, Wei Q, Li X, Chen N, Li Z, Wang X, Shen Y, Yao J, Huang R, Liu J, Cai D, Zeng H, Shen P. Multidisciplinary Team (MDT) Discussion Improves Overall Survival Outcomes for Metastatic Renal Cell Carcinoma Patients. *J Multidiscip Healthc* 2023; **16**: 503-513 [PMID: [36865786](#) DOI: [10.2147/JMDH.S393457](#)]
- 20 **Zhu S**, Chen J, Ni Y, Zhang H, Liu Z, Shen P, Sun G, Liang J, Zhang X, Wang Z, Wei Q, Li X, Chen N, Li Z, Wang X, Shen Y, Yao J, Huang R, Liu J, Cai D, Zeng H. Dynamic multidisciplinary team discussions can improve the prognosis of metastatic castration-resistant prostate cancer patients. *Prostate* 2021; **81**: 721-727 [PMID: [34028061](#) DOI: [10.1002/pros.24167](#)]





Published by **Baishideng Publishing Group Inc**  
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

**Telephone:** +1-925-3991568

**E-mail:** [bpgoffice@wjgnet.com](mailto:bpgoffice@wjgnet.com)

**Help Desk:** <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

