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Clinical Application and Teaching Practice of Palliative Treatment for Gastrointestinal Tumors

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Abstract: *Objective:* To explore effective methods for clinical teaching of palliative treatment for gastrointestinal tumors and enhance medical students' clinical application abilities and professional qualities in this field. *Methods:* Ninety-two students undergoing standardized residency training in clinical medicine during the 2023–2024 academic year at a certain institution were selected as the study subjects. A three-dimensional teaching model combining "theoretical lectures + clinical case discussions + bedside practical guidance" was employed to conduct teaching practice on palliative treatment for gastrointestinal tumors. Teaching effectiveness was evaluated through theoretical assessments, clinical skill operation scores, and teaching satisfaction questionnaires. *Results:* The average score of the theoretical assessment for the 92 students was 82.36 ± 5.18 points, and the average score for clinical skill operations was 84.52 ± 4.87 points. Eighty-nine students expressed satisfaction with the teaching model, resulting in a satisfaction rate of 96.74%. Conclusion: The three-dimensional teaching model can effectively improve the quality of clinical teaching on palliative treatment for gastrointestinal tumors, helping students quickly master core knowledge and skills, meeting the demands of clinical teaching, and is worthy of promotion and application.

Keywords: Gastrointestinal tumors; Palliative treatment; Clinical teaching; Medical students; Teaching model

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1. Introduction

Gastrointestinal tumors are highly prevalent malignant tumors worldwide, including esophageal cancer, gastric cancer, colorectal cancer, and others. Their incidence and mortality rates rank among the highest among malignant tumors [1]. Most patients are diagnosed at advanced stages, making surgical resection impossible, and thus palliative treatment becomes the core approach to improving their quality of life and prolonging survival. Palliative treatment for gastrointestinal tumors encompasses multiple dimensions such as pain management, nutritional support, psychological intervention, and symptom control, placing high demands on the comprehensive capabilities of clinicians [2]. As the future mainstay of clinical healthcare, medical students

urgently need to systematically acquire theoretical knowledge and clinical skills in palliative treatment for gastrointestinal tumors. Currently, the curriculum related to palliative treatment in medical education in China is relatively weak, with most institutions only briefly mentioning it in oncology courses and lacking targeted clinical teaching practice sessions [3]. Some medical students have insufficient knowledge of palliative care and hold the belief of "emphasizing curative treatment while underestimating palliative care", making it difficult for them to effectively address the complex symptoms and psychological needs of patients with advanced gastrointestinal tumors in clinical practice. Therefore, optimizing the clinical teaching model for palliative care of gastrointestinal tumors, strengthening teaching practice, and enhancing medical students' clinical application abilities have become urgent issues in the field of medical education. This study targeted 92 standardized training physicians in clinical medicine, conducting tailored clinical teaching practices and achieving favorable results. The report is as follows.

2. Materials and methods

2.1. General information

A total of 92 standardized training physicians in clinical medicine who were admitted to a Grade-A Tertiary Hospital from July 2023 to June 2024 were selected as the research subjects. All of these students had completed core courses in basic and clinical medicine, possessed a certain level of clinical theoretical foundation, and had no prior specialized training in palliative care for gastrointestinal tumors. Among them, there were 18 males and 74 females, aged between 22 and 25 years, with an average age of 23.45 ± 0.82 years; all were master's degree students. All students voluntarily participated in this study and remained fully engaged throughout the teaching practice without any withdrawal midway. Specific general information is presented in **Table 1**.

Table 1. General information of the research subjects

Gender	Number of participants (n)	Proportion (%)
Male	18	19.57
Female	74	80.43
Total	92	100.00

2.2. Teaching methods

A three-dimensional teaching model combining "theoretical lectures + clinical case discussions + bedside practical guidance" was adopted, with a teaching period of 4 weeks and a weekly teaching duration of 8 hours, totaling 32 hours. The specific teaching content and implementation methods are as follows:

2.2.1. Theoretical lectures

Senior physicians from the oncology and palliative care departments were invited to serve as instructors. They systematically explained the core theoretical knowledge of palliative care for gastrointestinal tumors, incorporating the latest clinical guidelines and research advancements. The lecture content included: the definition, principles, and current development status of palliative care; assessment and management of common symptoms in gastrointestinal tumors (such as pain, nausea and vomiting, constipation, malnutrition, etc.); the application of psychological interventions and social support in palliative care; ethical issues and communication skills for end-stage patients, etc. During the teaching process, various methods such as PowerPoint presentations, animated

demonstrations, and literature interpretation are employed to avoid mere theoretical indoctrination and emphasize the clinical applicability of knowledge. For instance, when explaining pain management, the practical application scenarios of assessment tools such as the Numerical Rating Scale (NRS) and the Faces Pain Scale-Revised (FPS-R) are incorporated, enabling students to master pain assessment methods for different patients. When discussing nutritional support, the dietary characteristics of patients with gastrointestinal tumors are considered to analyze the indications and precautions for selecting enteral versus parenteral nutrition.

2.2.2. Clinical case discussions

Typical clinical cases of palliative treatment for gastrointestinal tumors from our hospital are collected, including advanced esophageal cancer with pain and dysphagia, advanced gastric cancer with cachexia and psychological disorders, and advanced colorectal cancer with intestinal obstruction. Each case includes detailed medical history, physical examination, auxiliary examination, treatment plan, and prognosis. Students are divided into eight groups, with 11–12 students in each group, and each group is assigned 1–2 typical cases. Students are required to review relevant literature and guidelines before class to identify core issues and treatment approaches in the cases. During class, one representative from each group presents the case, explaining the case analysis process, proposed treatment plan, and rationale, while other students provide supplementary information and engage in discussion. The instructor evaluates the students' presentations, points out issues and deficiencies, optimizes the treatment plan based on clinical practice, guides students to establish a "patient-centered" clinical thinking mode, and cultivates their ability to analyze and manage complex cases.

2.2.3. Bedside practical instruction

Students will be arranged to enter the palliative care ward of the oncology department for bedside practical training, receiving one-on-one guidance from instructing physicians. The practical content includes the use of pain assessment tools, the preparation and infusion of analgesic drugs, the care of enteral nutrition tubes, the prevention and care of pressure ulcers, and the practical application of psychological communication skills. Instructing physicians will first demonstrate the operations, explaining key points, precautions, and potential risks, and then allow students to practice, supervising the entire process and promptly correcting any non-standard operations. For example, during the practical training on analgesic drug infusion, emphasis is placed on the precise calculation of drug dosages, control of infusion rates, and observation of adverse reactions; in psychological communication practice, different emotional states of patients and their families are simulated to guide students in employing communication skills such as empathy, active listening, and encouragement to alleviate psychological stress. Each student is required to complete bedside practical training for at least 10 patients to ensure mastery of core operational skills.

2.3. Evaluation metrics

2.3.1. Theoretical assessment

After the teaching period, a closed-book examination will be conducted for theoretical assessment. The exam paper will be jointly set by the lecturers and instructing physicians, with a full score of 100 points. The assessment content covers theoretical knowledge of palliative care for gastrointestinal tumors, clinical guidelines, drug applications, etc. The question types include multiple-choice questions (40 points), short-answer questions (30 points), and case analysis questions (30 points), focusing on evaluating students' grasp of theoretical knowledge and clinical application abilities.

2.3.2. Scoring of clinical skills operations

A scoring panel consisting of three supervising physicians will be formed to evaluate students' clinical operational skills using a unified skill scoring standard, with a full score of 100 points. The assessment covers pain assessment (20 points), analgesic drug infusion (25 points), enteral nutrition tube care (25 points), and psychological communication skills (30 points). Students will be comprehensively scored based on their operational standardization, proficiency, and communication abilities. The average score from the three assessors will be taken as the student's final skill score.

2.3.3. Teaching satisfaction questionnaire survey

A self-designed teaching satisfaction questionnaire will be used, covering eight dimensions, including the practicality of teaching content, the rationality of teaching methods, teachers' teaching abilities, and the effectiveness of skill enhancement. Each dimension will be rated on a four-point scale: very satisfied, satisfied, neutral, and dissatisfied, corresponding to scores of 4, 3, 2, and 1, respectively. A total score of ≥24 indicates satisfaction, while a score <24 indicates dissatisfaction. After the teaching period, questionnaires will be distributed to all students, with a total of 92 questionnaires issued and 92 valid questionnaires returned, achieving a 100.00% effective response rate.

2.4. Statistical methods

Data processing will be conducted using SPSS 26.0 statistical software. Measurement data will be expressed as (Mean ± SD), and count data will be expressed as [n (%)]. Paired t-tests will be used for comparing data within groups, with $P < 0.05$ considered statistically significant.

3. Results

3.1. Scores of theoretical assessment and clinical skills operation

The average score of the theoretical assessment for the 92 students was 82.36 ± 5.18 points, with 18 students achieving excellent results (≥90 points), 52 students achieving good results (80–89 points), 22 students achieving passing results (60–79 points), and 0 students failing (<60 points). The excellence rate was 19.57%, and the pass rate was 100.00%. The average score for clinical skills operation was 84.52 ± 4.87 points, with 23 students achieving excellent results, 55 students achieving good results, 14 students achieving passing results, and 0 students failing. The excellence rate was 25.00%, and the pass rate was 100.00%. The specific score distribution is shown in **Table 2**.

Table 2. Score distribution of students' theoretical assessment and clinical skills operation

Grade	Theoretical assessment (n, %)	Clinical skill operation (n, %)
Excellent (≥90 points)	18 (19.57)	23 (25.00)
Good (80–89 points)	52 (56.52)	55 (59.78)
Pass (60–79 points)	22 (23.91)	14 (15.22)
Fail (<60 points)	0 (0.00)	0 (0.00)

3.2. Results of teaching satisfaction survey

Among the 92 students, 58 (63.04%) were very satisfied, 31 (33.70%) were satisfied, 3 (3.26%) were neutral, and 0 were dissatisfied, resulting in a teaching satisfaction rate of 96.74%. Specifically, 89 students (96.74%) were satisfied with the practicality of the teaching content, 90 students (97.83%) were satisfied with the rationality of the teaching methods, 91 students (98.91%) were satisfied with the teachers' teaching abilities, and 88 students (95.65%) were satisfied with the effectiveness of skill enhancement. The specific satisfaction distribution is shown in **Table 3**.

Table 3. Results of students' teaching satisfaction survey

Satisfaction level	Number of participants (n)	Proportion (%)
Very Satisfied	58	63.04
Satisfied	31	33.70
Neutral	3	3.26
Dissatisfied	0	0.00

4. Discussion

Compared with traditional teaching models, the three-dimensional teaching model overcomes the drawback of "the disconnect between theory and practice" by emphasizing a "student-centered" teaching philosophy, fully mobilizing students' learning initiative and enthusiasm [4]. During case discussions and bedside practical sessions, students not only acquire knowledge and skills but also develop teamwork, communication, and problem-solving abilities through independent thinking, group discussions, and hands-on practice. This approach aligns with the requirements of modern medical education for cultivating high-quality clinical physicians [5]. Furthermore, both the instructors and clinical supervisors are seasoned clinicians with extensive clinical experience and teaching expertise. They can integrate the latest clinical guidelines, research advancements, and clinical realities to ensure the practicality and cutting-edge nature of the teaching content, helping students establish a scientific approach to palliative care [6].

This study employed a three-dimensional teaching model combining "theoretical instruction, clinical case discussions, and bedside practical guidance", effectively enhancing the quality of clinical teaching in palliative care for gastrointestinal tumors. In terms of teaching outcomes, students achieved a 100.00% pass rate in both theoretical assessments and clinical skills operations, with a teaching satisfaction rate of 96.74%. These results indicate that this teaching model meets the learning needs of medical students and facilitates the rapid acquisition of core knowledge and skills. The theoretical teaching sessions laid a solid knowledge foundation for students, clarifying the core principles and clinical norms of palliative care. The clinical case discussion sessions, through the analysis of real-life cases, guided students to integrate theoretical knowledge with clinical practice, fostering their clinical thinking skills [7]. The bedside practical guidance sessions allowed students to engage in skill training within real clinical settings, enhancing their operational proficiency and clinical application abilities. These three components complemented each other, forming a complete teaching cycle [8].

Despite the positive outcomes of the teaching practice in this study, there remain some issues and shortcomings. Firstly, some students do not attach sufficient importance to palliative care, holding traditional views that prioritize curative treatment over palliative care, and lack initiative in the learning process. Secondly,

in the case discussion sessions, some students exhibit weak abilities in reviewing literature and guidelines, with unclear approaches to case analysis, making it difficult for them to propose targeted treatment plans. Thirdly, during bedside practical training, due to the complexity of patients' conditions and significant individual differences, some students demonstrate insufficient ability to respond to unexpected situations. In response to these issues, the following improvement measures are proposed.

Firstly, strengthen education on the concept of palliative care. At the beginning of the teaching process, use methods such as sharing typical cases and conducting interviews with terminally ill patients to help students recognize the significance of palliative care in improving patients' quality of life, thereby changing traditional views and enhancing learning initiative. Secondly, introduce specialized training in literature retrieval and guideline interpretation, inviting library professionals and clinicians to jointly teach, guiding students to master literature retrieval methods and guideline interpretation skills, and improving their self-learning and research thinking abilities [9]. Finally, it is essential to diversify practical training scenarios by simulating various types of emergencies, such as adverse reactions to analgesic drugs and emotional breakdowns in patients, allowing students to conduct emergency response drills and enhance their emergency handling capabilities. Meanwhile, an individualized teaching guidance mechanism should be established to address the varying learning needs and abilities of students at different levels. This involves formulating differentiated teaching objectives and training plans to ensure that every student receives adequate guidance and improvement.

With the evolution of medical models and the rising health demands of the population, the role of palliative care in oncology treatment has become increasingly prominent, leading to a growing demand for clinicians specializing in palliative care for gastrointestinal tumors. In the future, medical education should further optimize its curriculum by incorporating palliative care into the core courses of clinical medicine, increasing teaching hours and practical sessions, and enhancing teaching content and methods [7]. Additionally, leveraging new technologies such as virtual reality (VR) and artificial intelligence, virtual palliative care wards and simulation teaching systems can be constructed to provide students with more realistic and safe teaching environments, thereby improving teaching effectiveness [10]. Furthermore, it is crucial to strengthen the construction of teaching teams by cultivating a group of dedicated palliative care instructors with both clinical experience and teaching abilities, establishing a scientific teaching evaluation system, continuously improving teaching quality, and training more high-quality palliative care professionals for clinical practice to advance the development of palliative care for gastrointestinal tumors in China.

In conclusion, the three-dimensional teaching model of "theoretical instruction + clinical case discussion + bedside practical guidance" demonstrates significant advantages in the clinical teaching of palliative care for gastrointestinal tumors. It effectively enhances students' theoretical knowledge, clinical skills, and teaching satisfaction, helping them establish a correct understanding of palliative care concepts and meet the needs of clinical teaching. By addressing issues in teaching practice and further optimizing the teaching model, we can continuously improve teaching quality and cultivate more outstanding medical professionals for clinical practice. This model is worthy of promotion and application in medical education.

Disclosure statement

The author declares no conflict of interest.

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