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Development and Evaluation of Role-Playing Teaching Method for Oncologists under the Multidisciplinary Team (MDT) Model

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Abstract: Objective: To develop a role-playing teaching method for oncologists under the multidisciplinary team (MDT) model and evaluate its effectiveness in enhancing oncologists' professional competence, teamwork skills, and clinical decision-making abilities, providing practical references for the training of oncologists. Methods: A total of 70 oncologists undergoing training in the Department of Oncology at the hospital from September 2024 to September 2025 were selected as the study subjects. They were randomly divided into an observation group and a control group, with 35 cases in each group, using a random number table method. The control group adopted the traditional teaching model, while the observation group implemented the MDT role-playing teaching method in addition to traditional teaching. The professional competence in oncology, healthcare teamwork skills, and clinical decision-making abilities of the oncologists in both groups were assessed. Additionally, data on teaching satisfaction among the oncologists and patient satisfaction with diagnosis and treatment were collected from both groups. *Results:* After the training, the total score and scores in each dimension of the observation group were significantly higher than those of the control group, and the scores of the observation group after training were significantly higher than those before training (all $P < 0.001$). The scores in each dimension of the observation group were significantly higher than those of the control group, and the scores of the observation group after training were significantly higher than those before training (all $P < 0.001$). The scores in each dimension of the observation group were significantly higher than those of the control group, and the scores of the observation group after training were significantly higher than those before training (all $P < 0.001$). The teaching satisfaction rate in the observation group was 97.14% (34/35), significantly higher than the 77.14% (27/35) in the control group ($x^2 = 4.590$, $P = 0.032 < 0.05$). The patient satisfaction rate with diagnosis and treatment in the observation group was 94.86% (166/175), significantly higher than the 81.71% (143/175) in the control group ($x^2 = 14.614$, $P < 0.001$). *Conclusion:* The role-playing teaching method under the MDT model can effectively enhance the professional competence, team collaboration ability, and clinical decision-making ability of oncologists, improve teaching satisfaction and patient satisfaction with diagnosis and treatment, and is suitable for promotion and application in the training of oncologists.

Keywords: Multidisciplinary collaboration; Oncology; Role-playing teaching method; Physician training; Competence assessment

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1. Introduction

With the rapid development of tumor diagnosis and treatment technologies, the multidisciplinary team (MDT) model has emerged as the core approach to cancer treatment. This model requires oncologists to possess not only solid professional knowledge but also excellent interdisciplinary communication, teamwork, and clinical decision-making skills [1]. However, current training for oncologists primarily focuses on imparting knowledge within a single discipline, lacking systematic cultivation of MDT thinking and practical abilities. As a result, physicians often struggle to fully contribute during clinical MDT consultations, thereby impacting the quality of diagnosis and treatment [2]. Role-playing teaching methods simulate real-life clinical scenarios, allowing learners to immerse themselves in the responsibilities and needs of different roles, thereby deepening their understanding of knowledge and enhancing skill application through interactive exchanges. This approach has demonstrated favorable teaching outcomes in the field of medical education [3]. Nevertheless, research on combining this method with the MDT model to provide specialized instruction for oncologists remains limited, and there is a lack of precise effect verification through small-sample, short-cycle studies. This study systematically evaluates the teaching effectiveness of implementing MDT role-playing teaching methods among 70 oncologists, providing empirical evidence to refine the training system for oncologists.

2. Materials and methods

2.1. General information

Seventy physicians who participated in training in the oncology department of the hospital from September 2024 to September 2025 were selected, including 22 standardized training physicians (in the 2nd to 3rd year of standardized residency training) and 48 visiting physicians (with 3 to 8 years of work experience). The study subjects were randomly divided into an observation group and a control group, with 35 cases in each group, using the random number table method. In the observation group, there were 19 males and 16 females, with an average age of (31.86 ± 3.72) years; among them, 6 had undergraduate degrees, 22 had master's degrees, and 7 had doctoral degrees; 10 had previously participated in MDT. In the control group, there were 18 males and 17 females, with an average age of (32.14 ± 3.58) years; among them, 7 had undergraduate degrees, 21 had master's degrees, and 7 had doctoral degrees; 9 had previously participated in MDT.

Inclusion criteria: (1) Possess a medical practitioner qualification certificate; (2) Volunteer to participate in this study and sign an informed consent form; (3) Participate fully in the 6-month training and the two evaluations before and after the training; (4) Have no serious physical illnesses or mental/psychological disorders and be able to participate normally in teaching activities. Exclusion criteria: (1) Interrupt training for more than 1 month during the training period due to reasons such as resignation or leave; (2) Have previously participated in training related to the MDT role-playing; (3) The completeness of the evaluation questionnaire filled out is less than 90%.

2.2. Methods

Both groups of physicians received six months of training. The control group adopted the traditional teaching model: four theoretical lectures per month (1.5 hours per session, covering treatment guidelines, research progress, etc.), two case discussions per month (1 hour per session), complemented by daily clinical teaching.

On the basis of traditional teaching, the observation group conducted two MDT (Multidisciplinary Team) role-playing teaching sessions per month (2.5 hours per session, totaling 12 sessions), with the following process: (1) Case preview (one week before training): Case materials were distributed, and physicians were

required to familiarize themselves with the background, consult guidelines and literature, and prepare discussion content; (2) Role-playing (1.5 hours): Seven physicians played the roles of multidisciplinary physicians, patients' family members, and the moderator, engaging in discussions centered around the case to reach a consensus; (3) Review and summary (1 hour): The teaching team provided feedback from three aspects—professional knowledge, role immersion, and teamwork—summarized key knowledge points and procedural highlights, and offered suggestions for improvement.

2.3. Observation indicators

The self-developed "Oncology Physician Professional Competence Scale" was employed to evaluate doctors' professional competence across six dimensions: disease diagnosis, treatment plan formulation, adverse reaction management, guideline application, doctor-patient communication, and literature interpretation. The "Medical Team Collaboration Competence Scale" (MTS Scale), adapted for this study, was used to assess doctors' team collaboration competence across five dimensions: role recognition, communication efficiency, conflict resolution, information sharing, and goal consensus. The Chinese version of the "Clinical Decision-Making Competence Scale" (CDMI Scale) was utilized to evaluate physicians' clinical decision-making competence across five dimensions: problem identification, information gathering, plan evaluation, risk prediction, and decision implementation. The self-developed "Teaching Satisfaction Questionnaire" and "Patient Treatment Satisfaction Questionnaire" were employed to collect satisfaction data.

2.4. Data collection

Prior to the training (September 2024) and after the training (March 2025), trained research assistants distributed the professional competence scale, team collaboration competence scale, and clinical decision-making competence scale to two groups of physicians. The questionnaires were filled out anonymously and collected on-site. A total of 420 questionnaires were distributed, with a 100% effective response rate. After the training, data were extracted from the hospital information system, and satisfaction questionnaires were randomly distributed to 175 patients from each group, totaling 350 questionnaires. A total of 309 valid questionnaires were returned, resulting in an effective response rate of 88.29%.

2.5. Statistical methods

Statistical analysis was performed using SPSS 26.0 software. Measurement data were expressed as mean ± standard deviation (Mean ± SD), with two decimal places retained. Paired t-tests were used for comparisons within groups before and after training, while independent sample t-tests were used for comparisons between groups. Count data were expressed as the number of cases [n (%)], and comparisons between groups were conducted using the x^2 test. A P-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Comparison of professional competence scores between the two groups of physicians before and after training

After training, the scores in all dimensions of the observation group were significantly higher than those of the control group, and the scores of the observation group after training were significantly higher than those before training (all $P < 0.001$) (**Table 1**).

Table 1. Comparison of professional competence scores between the two groups of physicians before and after training

Group	Disease Diagnosis		Treatment Planning		Adverse Reaction Management		Guideline Application		Doctor-Patient Communication		Literature Interpretation	
	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training
Observation (n=35)	10.15 ± 1.78	13.68 ± 1.15	12.42 ± 2.05	18.15 ± 1.48	9.75 ± 1.56	13.38 ± 1.08	10.42 ± 1.67	13.75 ± 1.19	9.15 ± 1.48	13.08 ± 1.02	12.75 ± 1.96	17.92 ± 1.38
Control (n=35)	10.08 ± 1.69	11.42 ± 1.28	12.35 ± 1.98	13.05 ± 1.76	9.68 ± 1.49	10.15 ± 1.37	10.35 ± 1.58	11.72 ± 1.25	9.08 ± 1.42	9.45 ± 1.31	12.68 ± 1.89	13.22 ± 1.57
t	0.169	7.770	0.145	13.121	0.192	10.954	0.180	6.959	0.202	12.935	0.152	13.302
P	0.867	<0.001	0.885	<0.001	0.848	<0.001	0.858	<0.001	0.841	<0.001	0.880	<0.001

3.2. Comparison of team collaboration ability scores between the two groups of physicians before and after training

After training, the total scores and scores in all dimensions of the observation group were significantly higher than those of the control group, and the scores of the observation group after training were significantly higher than those before training (all $P < 0.001$) (**Table 2**).

Table 2. Comparison of team collaboration ability scores between the two groups of physicians before and after training

Group	Role Perception		Communication Efficiency		Conflict Resolution		Information Sharing		Goal Consensus	
	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training
Observation (*n*=35)	9.12 ± 1.38	13.65 ± 1.05	11.42 ± 1.76	18.05 ± 1.28	8.75 ± 1.48	13.32 ± 1.07	10.15 ± 1.56	17.92 ± 1.18	16.42 ± 2.05	23.58 ± 1.46
Control (n=35)	9.05 ± 1.32	9.28 ± 1.25	11.35 ± 1.69	11.72 ± 1.58	8.68 ± 1.42	8.85 ± 1.35	10.08 ± 1.51	10.42 ± 1.43	16.35 ± 1.98	16.68 ± 1.87
t	0.217	15.837	0.170	18.419	0.202	15.352	0.191	23.932	0.145	17.206
P	0.829	<0.001	0.866	<0.001	0.841	<0.001	0.849	<0.001	0.885	<0.001

3.3. Comparison of clinical decision-making ability scores between the two groups of physicians before and after training

After training, the scores in all dimensions of the observation group were significantly higher than those of the control group, and the scores of the observation group after training were significantly higher than those before training (all $P < 0.001$) (**Table 3**).

Table 3. Comparison of clinical decision-making ability scores between the two groups of physicians before and after training

Group	Problem Identification		Information Gathering		Alternative Evaluation		Risk Prediction		Implementation	
	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training	Pre-training	Post-training
Observation (n=35)	12.45 ± 1.68	18.12 ± 1.19	12.72 ± 1.76	18.35 ± 1.26	14.15 ± 1.98	22.68 ± 1.42	11.42 ± 1.56	18.05 ± 1.12	8.75 ± 1.42	12.72 ± 1.01
Control (n=35)	12.38 ± 1.62	14.05 ± 1.28	12.65 ± 1.71	14.38 ± 1.35	14.08 ± 1.92	15.25 ± 1.58	11.35 ± 1.51	12.08 ± 1.29	8.68 ± 1.38	9.15 ± 1.25
t	0.177	13.777	0.169	12.719	0.150	20.692	0.191	20.674	0.209	13.142
P	0.860	<0.001	0.867	<0.001	0.881	<0.001	0.849	<0.001	0.835	<0.001

3.4. Comparison of teaching satisfaction among physicians and patient treatment satisfaction between the two groups

After training, the teaching satisfaction in the observation group was 97.14% (34/35), significantly higher than that in the control group at 77.14% (27/35) (x^2=4.590, P=0.032 < 0.05); the patient treatment satisfaction in the observation group was 94.86% (166/175), significantly higher than that in the control group at 81.71% (143/175) (x^2=14.614, P < 0.001).

4. Discussion

In recent years, the rapid development of tumor molecular biology and precision medicine technologies has propelled cancer treatment from a "single-discipline-led" approach into a new era of "multidisciplinary collaboration (MDT)" [4]. This transition imposes comprehensive capability requirements on oncologists: they must not only be proficient in specialized techniques such as chemotherapy, targeted therapy, and immunotherapy but also possess cross-disciplinary communication, teamwork, and clinical decision-making abilities. However, the current training system still focuses primarily on imparting knowledge within a single discipline, lacking systematic cultivation of MDT thinking and practical skills. This limitation restricts the efficiency of MDT-based treatment, making the development of training methods tailored to the MDT model an urgent need to enhance the quality of cancer care.

The research results indicate that the MDT role-playing teaching method has demonstrated remarkable effectiveness. After training, the total score for professional competence and the scores for each dimension in the observation group were significantly higher than those in the control group, with particularly notable improvements in the dimensions of treatment plan formulation, adverse reaction management, and doctor-patient communication. Traditional teaching primarily focuses on theoretical instruction, leaving physicians in a passive learning state and making it difficult for them to integrate guideline knowledge with clinical practice [5]. In contrast, MDT role-playing, by simulating real-world clinical scenarios, encourages physicians to actively integrate multidisciplinary knowledge to develop individualized treatment plans. Playing the role of patients' family members further enables physicians to empathize with patients' needs and optimize their management and communication strategies. Additionally, professional feedback and error correction from the teaching team further consolidate their professional competence [6].

As teamwork is the core of MDT clinical practice, the observation group outperformed the control group in all dimensions of teamwork ability, with the most significant improvements observed in communication efficiency and information sharing [7]. During simulated MDT discussions, physicians are required to clarify their own responsibilities, actively listen to interdisciplinary opinions, and break free from the limitations of single-discipline thinking through continuous communication and information exchange, thereby fostering a "patient-centered" collaborative mindset.

In terms of clinical decision-making ability, the observation group excelled in the dimensions of plan evaluation and risk prediction. In traditional teaching, physicians often rely heavily on guidance from their superiors and lack training in independent decision-making. In contrast, the MDT role-playing incorporates multiple critical diagnostic and treatment nodes, requiring physicians to integrate multidisciplinary opinions, comprehensively evaluate the efficacy, adverse reactions, and economic costs of treatment plans, predict potential risks, and develop response measures. This "immersive" training effectively enhances physicians' problem analysis and risk anticipation abilities [8].

Furthermore, teaching satisfaction among the observation group was significantly higher than that of the control group for several reasons: firstly, the role-playing approach was novel and interactive, breaking away from the monotony of traditional lectures and stimulating learning initiative; secondly, the teaching cases were derived from real clinical scenarios, enabling direct application of learning outcomes to work and fostering a strong sense of achievement; thirdly, the involvement of multidisciplinary experts provided cross-disciplinary perspectives, effectively addressing practical clinical issues [9]. The improvement in patient satisfaction with diagnosis and treatment was attributed to the overall enhancement of physicians' comprehensive abilities—professional competence reduced treatment delays and adverse reactions, teamwork skills improved diagnostic and treatment efficiency, and doctor-patient communication skills increased patient trust, ultimately leading to a significant improvement in satisfaction with diagnosis and treatment [10].

In conclusion, the role-playing teaching method under the MDT model can effectively enhance the professional competence, teamwork skills, and clinical decision-making abilities of oncology physicians, while also improving teaching satisfaction and patient satisfaction with diagnosis and treatment. It is thus worthy of promotion and application in the training of oncology physicians.

Disclosure statement

The author declares no conflict of interest.

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