Original Article
Effect of group management on disease cognition and fear of disease progression, nutritional status, and quality of life in patients with head and neck tumors

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Abstract: Objective: To investigate the effect of group guided training management on disease cognition and fear of disease progression, nutritional status, and quality of life in patients undergoing chemotherapy for head and neck tumors. Methods: A total of 88 patients diagnosed with malignant head and neck tumors who were admitted to Beijing Tongren Hospital, Capital Medical University from January 2020 to February 2021 were included as the subjects of this study. Patients receiving standard care were set as the control group (n=43), and patients undergoing group education were set as the study group (n=45). The fear of disease progression, level of hope, nutritional status, knowledge, attitude, behaviors, quality of life, self-management efficacy, and adverse reactions were compared between the two groups. Factors affecting patient's prognosis were also analyzed. Results: Group guided management for chemotherapy patients with head and neck tumors significantly reduced the fear of disease progression in the study group compared to the control group (*P*=0.010). Additionally, the study group showed significantly higher levels of hope (*P*=0.006), nutritional status (*P*=0.019), nutritional knowledge (*P*=0.006), positive attitude (*P*=0.007), and health behavior (*P*=0.032) than those in the control group. The incidence of malnutrition at 1 month and 3 months after intervention (*P*=0.005, *P*=0.009) and adverse reactions (*P*=0.001) in the study group were significantly lower than those in control group. Furthermore, the quality of life (*P*=0.011) and self-management efficacy (*P*=0.008, *P*=0.019) in the study group were significantly higher than those in the control group. Nursing interventions and self-efficacy were identified as independent risk factors for fear of disease progression and hope level (all *P* < 0.05). Conclusion: A group management model, through specialized health education and guidance, can significantly reduce patient's fear of disease progression, alleviate negative emotions, enhance their self-management ability, and improve quality of life. This approach fosters a proactive attitude toward treatment and contributes to better therapeutic outcomes.

Keywords: Group management, head and neck tumors, nutrition, quality of life

Introduction

Systemic chemotherapy in conjunction with localized radiotherapy serves as the first-line treatment for head and neck tumors [1-3]. While chemotherapeutic agents significantly inhibit tumor growth, the inherent heterogeneity of these tumors lead to considerable variability in both treatment response and prognosis among patients. As chemotherapy continues, patients are prone to bone marrow suppression, weakened immune function, impaired liver and kidney functions, and gastrointestinal damage, and malnutrition, among other adverse effects [4, 5], seriously hindering the continuation of chemotherapy and even posing a life-threatening risk to patients [6, 7]. Thus, maintaining or improving the nutritional status of patients undergoing chemotherapy or chemoradiotherapy is of paramount importance, as it is closely associated with improved prognosis [8].

The recurrent nature of head and neck tumors contributes to significant psychological burden on patients, with some experiencing relapse following an initial remission [8-10]. In a postoperative follow-up study of 120 survivors of head and neck tumors, Zhang et al. found that anxiety, depression, and impaired social functioning

were common in patients after surgery, and that active psychological interventions significantly enhanced patients' quality of life, as well as their hope levels, optimism, and alleviated depression and anxiety [11]. Research demonstrated that more severe negative psychological states such as anxiety, depression, and fear, could increase the likelihood of adverse reactions during chemoradiotherapy in cancer patients, and further follow-up revealed that higher incidence of adverse reactions, such as vomiting, corresponded to elevated rates of malnutrition [12, 13]. Thus, addressing psychological distress is crucial for improving the nutritional status of cancer patients. Enhancing patient adherence to treatment through scientific and reasonable management, reducing chemotherapy-related adverse reactions, alleviating the fear of disease progression, and improving overall quality of life are essential for the treatment of patients with head and neck tumors.

The group management model is an innovative disease management approach that integrates diagnosis, management, group health education, and individualized treatment. This model has been widely applied in the management of chronic non-communicable diseases, particularly conditions such as hypertension and diabetes. A study on breast cancer patients demonstrated that the group management enhances patients' exercise compliance [14], which plays a crucial role in improving their quality of life. Both domestic and international research mainly explores group management in the context of chronic non-communicable diseases, yielding commendable outcomes [15]. Research has indicated that group management can reduce glycated protein levels, lower blood pressure in diabetic patients, foster healthy lifestyle habits among patients, enhance their self-management abilities [16], and is beneficial to aerobic capacity and muscle strength in rheumatoid arthritis patients. Moreover, it alleviates pain symptoms and minimizes analgesic usage in chronic pain patients, aids in weight control for obese individuals, reduces heart rate and blood pressure, and elevates high-density lipoprotein and cholesterol levels. Group education and support training for disease management, as an adjunct to pharmacotherapy, significantly improves patients' awareness of their condition, compliance with relevant tests, and the adoption of healthier lifestyle habits. However, the application of a group management model in patients with head and neck tumors has not yet been reported. In this study, we employed the group management model for patients with head and neck tumors to assess its impact on their disease cognition, fear of disease progression, changes in nutritional status after intervention, and its impact on the overall quality of life in these patients.

Materials and methods

Study design

Current conventional nursing models for patients with head and neck tumors often fail to adequately address critical issues such as patient malnutrition and psychological well-being. Therefore, in this retrospective analysis, we compared the rehabilitation indicators, malnutrition rates, complication rates, and other relevant outcomes between patients who received group management and those who received routine care.

Baseline data

A total of 88 patients with malignant head and neck tumors admitted to Beijing Tongren Hospital, Capital Medical University from January 2020 to February 2021 were retrospectively selected and divided into two groups based on their ward area. Patients receiving standard care were set as the control group, and patients undergoing group management were set as the study group.

Inclusion criteria: ① Patients who met the clinical diagnostic criteria for malignant head and neck tumors as defined by the World Health Organization [17]; ② Patients aged 18-70 years; ③ Patients who underwent chemotherapy; ④ Patients with no intellectual disability, capable of completing various tests under the guidance of researchers.

Exclusion criteria: ① Patients with serious complications; ② Patients with severe mental illness or cognitive dysfunction; ③ Patients with other respiratory, cardiovascular, or cerebrovascular diseases.

Ethical statement

This study was approved by the Ethics Committee of Beijing Tongren Hospital, Capital Medical University.

Intervention method

Patients in the control group received standard care under the supervision of attending physician and nurse. The physician provided appropriate treatment according to the patient's condition, while the nurse delivered basic care, including routine health education, nutritional guidance, and preventive measures for potential complications. Additionally, a health education manual was provided to each patient prior to discharge.

Patients in the study group were given group management.

1. Construction of a professional team: The group management team was composed of an attending physician, a dietitian, and three nurses. Following an extensive review of relevant literature [13, 18], a group management plan was formulated. The attending physician was responsible for establishing the patient's treatment protocol and promptly addressing any complications that arose throughout the treatment. The nurses coordinated patient care and implemented nursing interventions, while the dietitian provided health education, focusing on nutritional guidance.

2. In-hospital management: Patients participated in scheduled group sessions every Wednesday afternoon, each lasting 60 minutes. Each patient participated in a minimum of three group sessions, with each group comprising no fewer than five members. (1) Warm-up communication (10 minutes): The group management team and patients introduced themselves separately. Patients briefly introduced their treatment experience, allowing them to feel supported. Through communication, patients could enhance mutual understanding and lay a good foundation for health education. (2) Health education (30 minutes): Using videos, physical models, and other visual aids, patients were educated on their diseases and nutrition. The session began with an inquiry about their dietary habits, including meal frequency, portion sizes, and any post-meal discomfort. Patients were instructed to reduce the consumption of pickled and smoked foods, increase their consumption of fruits and vegetables, engage in regular exercise, and to quit smoking and avoid alcohol. Patients were encouraged to maintain a dietary journal to track changes in food intake and body weight. To ensure the effectiveness of education, each session focused on a single theme, such as nutritional guidance, development of healthy eating habits, and lifestyle adjustment. Following each session, patients were provided with a brochure for reference and reinforcement of the material. (3) Question-and-answer session (10 minutes): Based on the information provided in the educational materials and their personal experiences, the patients were encouraged to raise questions based on their daily lives, and the group managers addressed these inquiries promptly. (4) Experience sharing (10 minutes): Patients exchanged their personal experience, and those with favorable prognoses were invited to share their insights and strategies during the rehabilitation process, encouraging others to follow their example.

3. Out-of-hospital management: A WeChat group was established to facilitate communication among patients, with the condition that discussions should focus solely on medical issues. Each week, group administrators posted rehabilitation advice, tips for preventing complications, and updates on new medications, ensuring that patients remained informed about the latest treatment advancements and bolstering their confidence in recovery. Throughout the treatment process, patients were encouraged to seek clarification on any challenges they encountered, with administrators providing guidance to help maintain a positive outlook. Additionally, a monthly Q&A session was also held, during which exemplary participants were recognized and rewarded, through public praise or invitations to share their experiences, thereby encouraging extensive patient engagement and improving adherence to treatment protocols.

Outcome measurements

The following indicators were assessed at four time points: before intervention (T0), immediately after intervention (T1), 1 month after intervention (T2), and 3 months after intervention (T3) in the two groups.

Fear of disease progression

Patients' fear of disease progression was evaluated using the Fear of Progression Questionnaire-Short Form (FoP-Q-SF). The FOP-Q-SF

shows high internal consistency (Crohnbach's α=0.87) and uses a 5-point Linkert scale, where 1 point indicates "none" and 5 points indicate "always". A score greater than 34 points suggests psychological dysfunction, with higher scores indicating greater fear of disease progression [18].

Level of hope

The level of hope in patients was assessed using the Herth Hope Index (HHI), which measures various dimensions of hope using a 4-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree), with items #3 and #6 being reverse-coded. A score of < 23 points indicates a low level of hope, a score of 24-35 points reflects a moderate level of hope, and a score of > 36 points signifies a high level of hope [19].

Nutritional status

Nutritional status of the patients was evaluated using Patient-Generated Subjective Global Assessment (PG-SGA). The PG-SGA includes a patient-generated historical component (Weight History, Food Intake, Symptoms and Activities and Function), a professional part (Diagnosis, Age, Metabolic stress, and Physical Exam), and a Global Assessment (A = well-nourished, B = moderately malnourished or suspected malnutrition, C = severely malnourished), the total numerical score, and nutritional triage recommendations. Subsequently, the scored PG-SGA allows for triaging of specific nutrition interventions, as well as facilitating quantitative outcomes data collection. The total PG-SGA score is calculated by summing components a, b, c, and d, with higher scores indicating worse nutritional status of the patient [20].

Based on the patient's weight, nutritional intake, symptoms and signs: 0-1 point indicates good nutrition, 2-8 represent suspected or moderate malnutrition, ≥ 9 represent severe malnutrition. When malnutrition is present, nutritional supplementation is necessary to improve symptoms [21].

Nutritional knowledge, attitudes, and behavioral levels

The level of nutritional knowledge, attitudes, and behaviors of the patients was evaluated using the self-developed questionnaire for pa-

tients with head and neck tumors. The questionnaire involved three dimensions, including nutritional knowledge, attitude, and behavior, with a total of 30 items. The nutritional knowledge dimension contained 17 items, with 1 point for each correct answer, yielding a maximum score of 17 points; the attitude dimension comprised 5 items on 5-Point Likert Scale (0 points for strongly disagree, 4 points for strongly agree), with a total score of 20 points; the behavior dimension included 5 items of positive scoring and 3 negative scoring items, with a total score of 32 points. Patients were scored before intervention and 3 months after intervention. Higher scores indicated a better level of nutritional knowledge, attitudes, and behaviors.

Quality of life

The quality of life was evaluated using the European Organization for Research and Treatment of Cancer Core Quality of Life questionnaire (EORTC QLQ-C30). This questionnaire includes five functional scales (physical, role, affective, cognitive, and social), three symptom scales (fatigue, pain, nausea, and vomiting), and one general health scale [22]. Higher scores indicated better quality of life.

Self-management efficacy

The Strategies Used by People to Promote Health (SUPPH) scale was used to evaluate the patients' self-management efficacy. The scale includes a total of 29 items, which are self-evaluated by patients according to their condition on 5-point Likert scale, with 1 point representing no confidence and 5 points representing highly confident [23]. Higher scores indicated better self-management efficacy.

Adverse reactions

Adverse reactions were evaluated in patients undergoing chemotherapy. A lower incidence of adverse reactions suggested that the interventions helped reduce the adverse effects of chemotherapy, thereby enhancing treatment compliance and improving the quality of life.

Statistical methods

Statistical Package for the Social Sciences (SPSS) 22.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis, and Graphpad Prism 8 (GraphPad Software, Boston, MA, USA)

Table 1. Comparison of baseline data between the two groups [(mean ± SD)/(n)]

| Baseline data		Control group (n=43)	Study group (n=45)	F/χ^2	P
Gender	Male	22	25	0.171	0.680
	Female	21	20		
Average age (years)		44.12±13.18	45.83±14.75	0.573	0.568
Disease duration (years)		3.52±1.03	3.67±1.17	0.526	0.637
Education level	Junior high school and below	15	19	0.759	0.684
	High school, secondary school	11	12		
	College and above	17	14		
Staging	Phase I	10	16	1.932	0.587
	Phase II	15	12		
	Phase III	12	10		
	Stage IV	6	7		

SD: standard deviation.
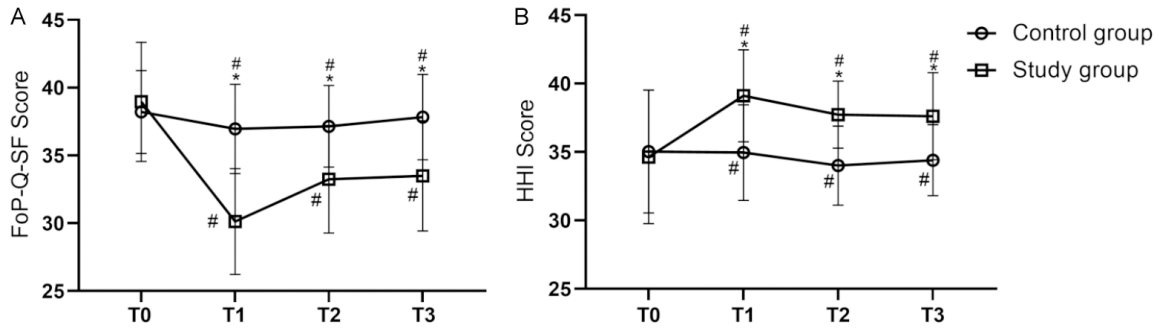
Figure 1. Comparison of fear of disease progression (A) and level of hope (B) between the two groups. *P < 0.05 between the two groups, #P < 0.05, compared with before intervention. FoP-Q-SF: Fear of Progression Questionnaire-Short Form; HHI: Herth Hope Index; T0: before intervention; T1: immediately after intervention; T2: 1 month after intervention; T3: 3 months after intervention.

was used for graphing. Enumeration data were represented by [n (%)] and analyzed using χ^2 test. Measurement data, such as age and FoP-Q-SF score, were tested for normality and were represented by mean ± standard deviation (SD). Inter-group comparisons at the same time point were performed using t-tests, while repeated measures analysis of variance was used for intra-group comparisons before and after the intervention. Multivariate logistic regression analysis was used to identify prognostic factors. P < 0.05 indicated a statistically significant difference.

Results

Comparison of baseline data between the two groups

There was no significant difference in the baseline data such as gender, age, course of dis-

ease, education level, and disease staging between the two groups (all P > 0.05, **Table 1**), indicating that the groups were comparable.

Comparison of fear of progression and level of hope between the two groups

After intervention, the total FoP-Q-SF scores for both groups were lower than those before intervention (all P < 0.05). After intervention, the total FoP-Q-SF scores in the study group were significantly lower than those in the control group at various time points (all P < 0.05) (**Figure 1A**).

After intervention, the HHI hope scores for both groups were significantly higher than those before intervention (all P < 0.05). Moreover, the HHI scores in the study group were all significantly higher than those in the control group at various time points (all P < 0.05) (**Figure 1B**).
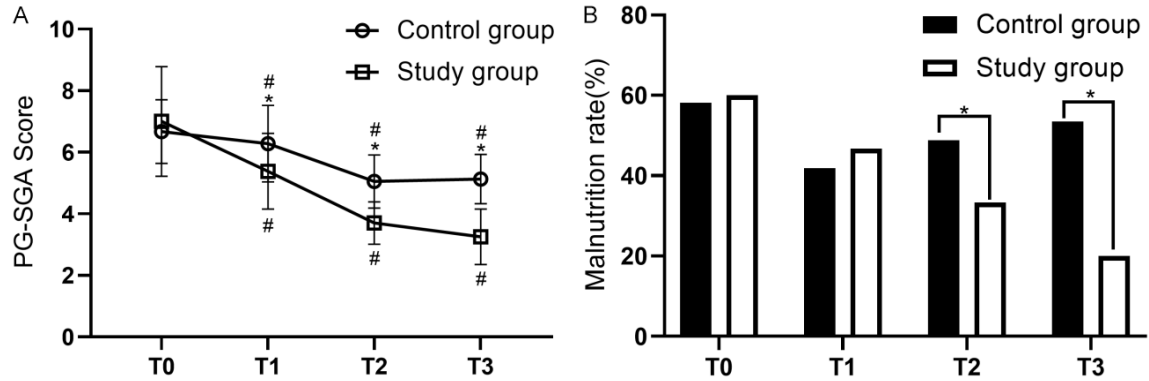
Figure 2. Comparison of nutritional status (A) and malnutrition rates (B) between the two groups. *P < 0.05 between the two groups, #P < 0.05, compare with before intervention. PG-SGA: Patient-Generated Subjective Global Assessment; T0: before intervention; T1: immediately after intervention; T2: 1 month after intervention; T3: 3 months after intervention.
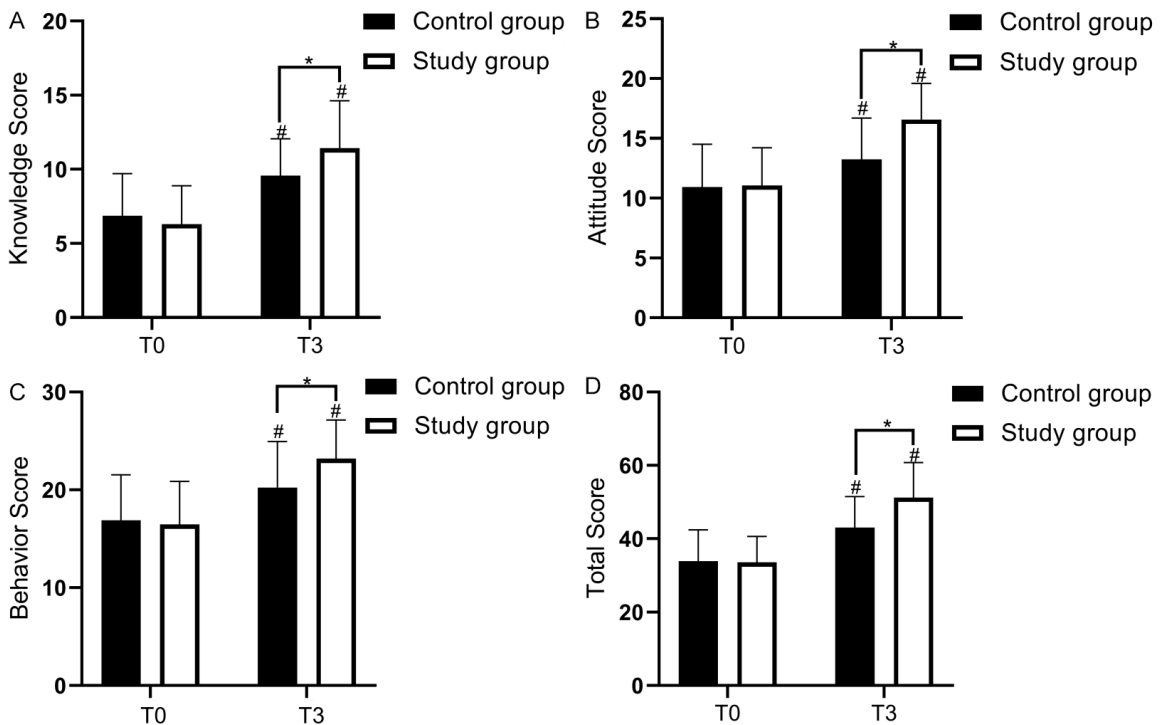

Figure 3. Comparison of knowledge (A), attitude (B), behavior (C) and total score (D) between the two groups. *P < 0.05 between the two groups, #P < 0.05, compared with before intervention. T0: before intervention; T3: 3 months after intervention.

Comparison of nutritional status between the two groups

After intervention, the total PG-SGA scores at various time points of the two groups were all lower than those before intervention (all P < 0.05). Additionally, the total PG-SGA scores in the study group were all significantly lower than those in the control group at various time points (all P < 0.05) (**Figure 2A**).

After intervention, the number of patients with malnutrition in the study group at T1 was fewer than that in the control group; however, the difference was not obvious. With the extension of the intervention, at T2 and T3, the incidence of
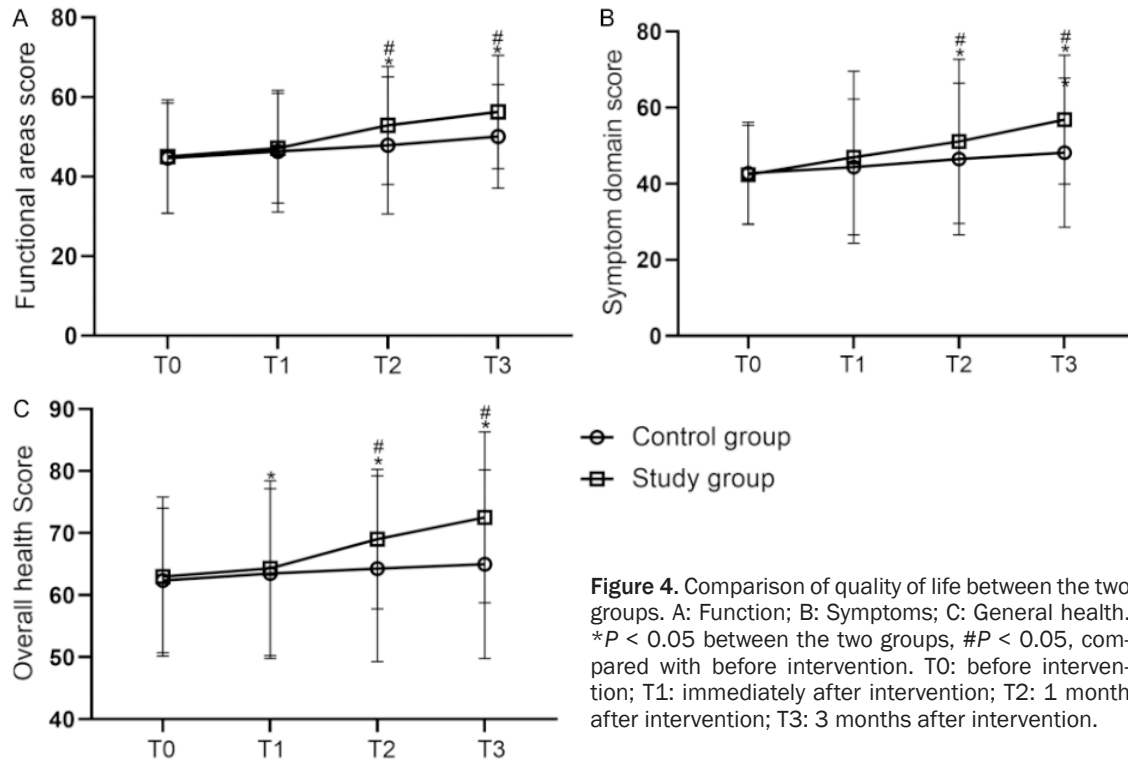
Figure 4. Comparison of quality of life between the two groups. A: Function; B: Symptoms; C: General health. *P < 0.05 between the two groups, #P < 0.05, compared with before intervention. T0: before intervention; T1: immediately after intervention; T2: 1 month after intervention; T3: 3 months after intervention.

malnutrition in the study group was significantly lower than that in the control group (all P < 0.05) (**Figure 2B**).

Comparison of nutritional knowledge, attitudes, and behavior between the two groups

After intervention, the scores of nutrition knowledge (**Figure 3A**), attitude (**Figure 3B**), and behavior (**Figure 3C**) as well as the total score (**Figure 3D**) in the two groups were significantly improved compared with before intervention (all P < 0.05). Furthermore, these scores of the study group were all significantly higher than those of the control group (all P < 0.05).

Comparison of quality of life between the two groups

After intervention, the scores of the function (**Figure 4A**), symptoms (**Figure 4B**), and overall health (**Figure 4C**) in both groups were elevated compared with before intervention. Specifically, at T2 and T3, these scores in the study group were significantly higher than those in the control group (*all* P < 0.05) and were significantly higher from those before intervention (all P < 0.05).

Comparison of self-management efficacy between the two groups

After intervention, both groups showed increases in positive attitude scores (**Figure 5A**), self-decision scores (**Figure 5B**), self-decompression scores (**Figure 5C**), and total self-management efficacy (**Figure 5D**) compared with before intervention; however, the increase in positive attitude (**Figure 5A**) and self-decision (**Figure 5B**) scores in the control group were not significant.

At T2 and T3, the positive attitude scores in the study group were significantly higher than those in the control group (all P < 0.05). At T1, T2, and T3, the study group showed significantly higher scores in self-decision, self-decompression, and the total score of self-management efficacy compared to those in the control group (all P < 0.05) (**Figure 5**).

Comparison of adverse reactions between the two groups

The incidence of adverse reactions during intervention was 40% in the study group, significantly lower than 74.42% in the control group (*P*=0.001) (**Table 2**).
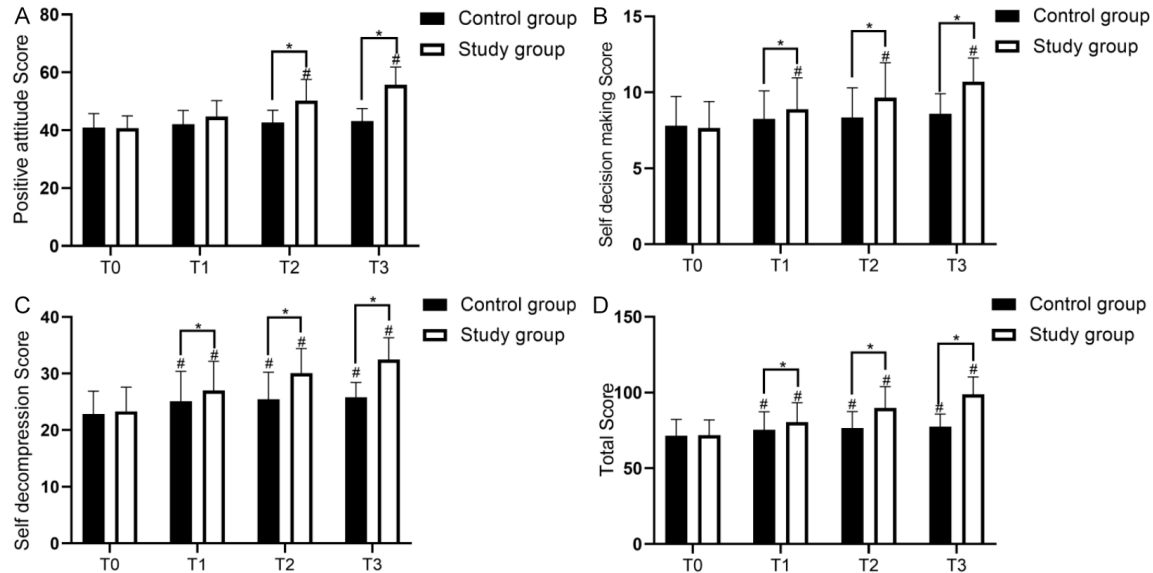
Figure 5. Comparison of self-management efficacy between the two groups. A: Positive attitude; B: Self-decision; C: Self-decompression; D: Self-management efficacy. *$P < 0.05$ between the two groups; #$P < 0.05$, compared with before intervention. T0: before intervention; T1: immediately after intervention; T2: 1 month after intervention; T3: 3 months after intervention.

Table 2. Comparison of adverse reactions between the two groups (n, %)

Group	n	Nausea and vomiting	Weakness	Rash	Alopecia	Myelosuppression	Total number of cases
Study group	45	5 (11.11%)	2 (4.44%)	2 (4.44%)	3 (6.67%)	6 (13.33%)	18 (40%)
Control group	43	8 (18.63%)	6 (13.95%)	3 (6.98%)	5 (11.63%)	10 (23.26%)	32 (74.42%)
X^2	-	-	-	-	-		10.617
P	-	-	-	-	-		0.001

Table 3. Independent prognostic factors for patients with head and neck tumors

Dependent variable	Risk factor	B	S.E	Wald	P	OR	95% CI
Fear of disease progression	Nursing interventions	1.359	0.6659	4.265	0.035	3.985	1.065-14.215
	Self-efficacy	-0.526	0.625	6.326	0.041	0.821	0.519-1.986
Level of hope	Nursing interventions	1.885	0.856	4.871	0.026	6.401	1.212-30.265
	Self-efficacy	-0.213	0.456	0.281	0.049	0.811	0.336-1.819

B: coefficient; S.E: standard error; Wald: Wald Chi-Square Statistic; P: probability; OR: odds ratio; 95% CI: 95% confidence interval.

Analysis of factors affecting the prognosis of patients in two groups

The primary outcomes of this study were patients' fear of disease progression and their level of hope. A multivariate logistic regression analysis was conducted, with fear of disease progression and level of hope as dependent variables, and nursing interventions, sex, age, education level, disease duration, disease stage, nutritional status, and self-efficacy as in-dependent variables. The results indicated that both nursing interventions and self-efficacy were independent risk factors for fear of disease progression and level of hope in patients (all $P < 0.05$) (**Table 3**).

Discussion

Chemotherapy remains the primary treatment modality for patients with head and neck tumors. While effective in eradicating cancer

cells, chemotherapy also affects healthy cells, leading to side effects such as nausea, vomiting, loss of appetite, and malnutrition, among others. These adverse effects compromise patients' ability to absorb adequate nutrients, impairing organ function and weakening the immune system, and ultimately impacting the treatment efficacy [24].

The concept of group management emerged in the 1970s as an innovative model for disease management model, and it offers systematic patient management, combining treatment, behavioral guidance, and health education [25]. Unlike traditional one-to-one care, this model primarily fosters interaction between medical teams and patient groups to foster patients' beneficial habits and improve self-management ability and quality of life. It represents a commendable health management approach deserving wider implementation within the community [26]. Currently, there is a scarcity of research on the group management model among patients with head and neck tumors. This study aims to investigate the effectiveness of a group management model in improving nutritional status, quality of life, and disease progression control in these patients, thereby providing valuable insights for enhancing their quality of life.

The results of this study indicate that, compared to the control group, those in the study group undergoing group management exhibited significantly lower FoP-Q-SF and PG-SGA scores and markedly higher HHI scores. Follow-up evaluations further revealed better nutritional status in the study group compared to the control group. Furthermore, patients in the study group demonstrated enhanced health knowledge. These findings suggest that the group management model contributes to improving the nutritional status of patients with head and neck tumors, enhancing their quality of life and health knowledge acquisition, which undoubtedly aids in the rehabilitation process. A study on head and neck cancer patients confirmed the impact of emotional states on patient outcomes, revealing poor quality of life among patients, with significant gender-based differences in quality of life scores after radiochemotherapy interventions [27]. This disparity may be related to thinking differences between men and women, as well as the varying levels of health knowledge among patients of different genders, which may impact the recovery process.

At T2 and T3, the self-management scores across all scales in the study group were significantly higher than those in the control group and were significantly improved compared to baseline values. At T2 and T3, the positive attitude scores in the study group were significantly higher than those in the control group. Additionally, at T1, T2, and T3, the study group exhibited significantly higher scores in self-decision, self-decompression, and the total self-management efficacy score compared to those in the control group. Moreover, the incidence of adverse reactions in the study group was significantly lower than that in control group. Head and neck tumors are characterized by disease progression and significant treatment challenges. Traditional nursing models often involve singular care approaches typically led by nursing staff. Even in multidisciplinary synergistic nursing, the patients may experience confusion, leading to difficulties in receiving comprehensive and holistic care during treatment. A study on head and neck cancer patients [28] indicated that proper nursing measures enhance patient treatment adherence, thereby laying a solid foundation for their compliance with medical instructions, which is consistent with the findings of this study. The findings of this study support that the group management model ensures continuous nursing for patients through group interventions. This approach not only optimizes the efficient use of medical resources but also provides psychosocial support during treatment. Patients benefit from the encouragement and support of medical staff, family, friends, and fellow patients, which plays a significant role in enhancing treatment adherence and accelerating recovery.

In conclusion, group management enhances health education through collaboration between medical and nursing teams, thereby enhancing patients' cognition of disease and nutrition, improving their nutritional status, eliminating the fear of disease, and fostering confidence in overcoming disease. This model also enhances self-management abilities, reduces the incidence of side effects such as malnutrition, nausea and vomiting, improves treatment outcomes, and ultimately enhances their quality of life. The innovation of this study lies in its pioneering application of group management in

the adjuvant treatment of patients with head and neck tumors, using quantitative indicators to evaluate its effectiveness. The comprehensive data provide valuable references and offer more options for improving the prognosis of these patients.

Some limitations in this investigation still exist. Physiological and biochemical indicators were minimally assessed, with most data derived from questionnaire results. Additionally, this study was conducted in a single center with a relatively small sample size, which may limit the generalizability of the findings. Future research will focus on a more comprehensive analysis of patients' physical and biochemical indicators, and a multi-center, large-sample, prospective study will be conducted to develop more accurate and detailed intervention strategies for improving the nutritional status and quality of life of patients with head and neck tumors during chemotherapy.

Disclosure of conflict of interest

None.

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