

Nurses Perceptions on Head and Neck Malignancies and Attitudes toward Cluster Oral Care Nursing in a selected Hospital in China

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Abstract: As a key treatment for patients with head and neck tumors, radiotherapy has a significant clinical effect. However, the occurrence of oral mucositis after radiotherapy seriously affects the prognosis of patients. This aims to further improve the cluster nursing system and achieve the prevention and intervention effect of oral mucositis in patients with head and neck tumors and explores the respondent's perception of head and neck malignancies and attitudes toward cluster oral care nursing. Results show that respondents have a more positive perception of head and neck malignancies and cluster oral care, believing that the cluster care system can effectively prevent oral mucositis, provide accurate oral care information, reduce the severity of oral mucositis, and improve the quality of life of patients.

Keywords: Cluster Oral Care; Head and Neck Tumors; Radiological Correlation; Oral Mucositis.

1. Introduction

Radiotherapy stands out as an effective treatment for head and neck tumors, but the consequential occurrence of complications, particularly oral mucositis, significantly impacts patient prognosis. Head and neck tumors, marked by high morbidity and mortality, account for approximately 380,000 new cases worldwide annually, ranking eighth in malignant tumor-related deaths (Wu et al., 2022). Radiotherapy remains the primary treatment for these malignancies, with studies showcasing a 90 percent cure rate in early-stage cases treated solely with radiation (Pereira, et al., 2019). Despite its efficacy, radiotherapy for head and neck tumors damages salivary glands, leading to reduced saliva secretion, increased oral mucosa brittleness, and common symptoms like dry mouth, oral pain, radioactive oral mucositis, and diminished appetite (Winter et al., 2021). Radiation oral mucositis (RTOM) emerges as the most prevalent side effect, with an incidence reaching 97% during conventional radiotherapy, and nearly 85% experiencing Grade 3 or 4 oral mucositis (Sonis, 2022). Severe cases manifest as oral ulcers, bleeding, restricted mouth opening, and dysphagia, significantly affecting patient prognosis. The confluence of radiotherapy and chemotherapy results in nearly universal oral mucositis among treated patients (Sonis, 2022).

Statistical trends regarding the prevalence and impact of RTOM in patients undergoing head and neck tumor treatment highlight the substantial burden faced by these individuals. Nearly all patients undergoing conventional radiotherapy experience some degree of oral mucositis, with a significant proportion facing severe grades of mucositis (Sonis, 2022). This underscores the critical need for effective interventions to manage and prevent oral mucositis in this patient population.

Effectively addressing the challenges posed by RTOM has become a pivotal concern in the nursing process for head and neck cancer patients. Nursing interventions for radiation-associated oral mucositis are currently effective, with cluster

nursing emerging as a potential key approach. Scholars have explored various intervention methods, encompassing Kangfuxin solution, oral Chinese herbal compounds, and burn ointment application, aiming at enhancing patient prognosis by mitigating oral mucositis (Wang et al., 2021; Liu, 2022; Yuan et al., 2022; Sun et al., 2022; Wang et al., 2017; Peng et al., 2022).

However, challenges persist in standardizing these interventions due to variations in methods and timing. Studies have explored nursing system development, clinical pathways, evidence-based practices, continuous, and cluster nursing, still no consensus (Iovoli et al., 2023; Pulito, 2020). Cluster nursing, grounded in evidence-based practices, holds significant research significance towards advancing the clinical nursing approaches standardization (Cardos et al., 2021; McLachlan et al., 2020).

Preliminary progress was made in using cluster nursing from head and neck tumor patients, effectively alleviating oral mucosal injuries and managing negative emotions (Dhopte & Bagde, 2022). Nonetheless, current cluster care systems precisely target patients with oral mucositis, leaving a gap in effectively intervening for patients without oral mucositis. This matter requires additional consideration toward improving the comprehensive care of head and neck tumor patients undergoing radiotherapy. The research's significance lies in providing clarity regarding preventive and intervention effects resulting from the cluster nursing system implementation. Understanding how this nursing system impacts the oral mucositis occurrence and severity in head and neck cancer patients undergoing radiotherapy is essential for the overall quality of care. This study explored the perception of nurses towards head and neck malignancies and attitudes toward cluster oral care nursing of patients with head and neck malignancies.

This study explores the respondent's perception about head and neck malignancies, and attitudes toward cluster oral care nursing of patients with head and neck malignancies. Mostly to identify the demographic profile of respondents; assess the extent of respondents' perceptions regarding head and neck

malignancies, specifically oral cancer; ascertain the respondent's attitude towards cluster oral care nursing to patients with head and neck malignancies, specifically oral cancer; determine the difference of the respondents' perceptions regarding head and neck malignancies and attitude towards cluster oral care nursing when grouped according to demographic variables; and, infer the relationship of the respondents' perceptions regarding head and neck malignancies and attitudes towards cluster care nursing.

2. Results

A total of 70 nurses from the Oncology Department. In terms of the demographic profile (Table 1 and 2), females dominated; the majority of respondents were between the ages of 20-44 years old and were dominated by BSN graduates (Bachelor's Degree); contractually employed; they were mainly allocated to head, neck and abdomen cancer wards; years of experience, with a mean experience of 10.929 years; the number of head and neck malignancy capacity building activities ranged from 0 to 3; and, the number of cluster care training ranged from 0 to 6.

Table 1. Frequency distribution of basic information

Characteristics		Frequency
Sex	Male	2
	Female	68
Age	20-44 Years Old	66
	45-64 Years Old	4
Highest Educational Attainment	BSN	33
	MAN	24
	PhD	13
Status of Employment	Regular	6
	Contractual	64
Unit Assignment	Head, Neck and Abdomen Cancer Ward	20
	Pelvic Cancer Ward	14
	Second Chest Cancer Ward	15
	First Chest Cancer Ward	15
	Invasive Cancer Ward	6

Table 2. Descriptive analysis of basic information.

Characteristics	Average
Years of Experience	10.9
Number of Capacity-Building Activities on Head and Neck Malignancies	1.5
Number of Cluster Care Training	1.7

In the extent of perception of oral mucositis (Table 3), respondents had some knowledge of oral mucositis, were generally familiar with the preventive measures, were familiar with the causes of oral mucositis, familiar with oral mucositis in China, and were slightly familiar with oral mucositis in other countries. Regarding the perceptions on oral cancer, the respondents think proper oral care is good for patients and agree that appropriate oral care is beneficial to patients; respondents were neutral if oral cancer treatment is expensive; and most respondents thought smoking was

associated with oral cancer. The occurrence of oral cancer is related to long-term chronic inflammation of the mouth. Respondents were neutral on oral cluster care saving nurses' time, and drinking alcohol causes mouth cancer. Respondents think that cluster oral care treatment is effective in improving the patient's condition. In the perception of managing oral mucositis, respondents perceived that the stimulation of poor prostheses is the cause of oral cancer has a large difference on this issue; neutral on the radiotherapy and chemotherapy for oral cancer patients will cause psychological harm to the patients, same with the chemo-radiotherapy can endanger the physical and mental health of patients; the telemedicine technology leads to unauthorized access to patient medical information had some concerns; and, most respondents agree that chronic inflammation and repeated stimulation can induce oral cancer. In the perception of oral cancer on its factors that influence oral hygiene, the respondents agree that oral cancer radiotherapy should be instructed to clean their teeth with a soft toothbrush; the same on patients should be instructed to eat soft or liquid food, easily digested, high in protein and vitamin, and avoid a spicy diet to reduce the irritation and damage to the oral mucosa; endorsed to be instructed to gargle with saline or a doctor's mouthwash after getting up and before going to bed; mostly agree on should be instructed to gargle before and after eating saline or a doctor's mouthwash; and, should patients be instructed to gargle with saline or a doctor's mouthwash after vomiting.

Respondent's attitude on cluster oral care (Table 4) achieve effective prevention of oral mucositis in patients with head and neck tumor during radiotherapy, mostly thought that cluster treatment was effective in the prevention of oral mucositis during radiotherapy; on cluster oral care can provide accurate information on oral care mostly think that the centralized oral care system is effective; on cluster oral care helps not to aggravate the severity of oral mucositis most were neutral and have doubts about the effect of relieving symptoms; on the ability of the cluster oral care for head and neck tumor radiotherapy patients is promising to achieve effective prevention of oral mucositis in the course of radiotherapy for head and neck tumor patients, mostly have reservations about the preventive effect of the system; on cluster oral care is able to help in increasing work efficiency, mostly thinks effective in improving work efficiency; on nurses involving in the cluster oral care must be familiar with the use of the cluster oral care system, mostly agree that nurses need to be familiar with the system use; on an easy-to-learn and easy-to-use cluster oral care is very important for telenursing, most believe that easy to use is important for remote care; on cluster oral care would assist people with disabilities, older adults and patient with chronic diseases, mostly neutral on the following: cluster oral care can help the person being served to carry out self-care in their home or the living environment they are familiar with, most on and on cluster oral care system can help the served people to self-manage and thus control health issues; on cluster oral care can help the person being served to develop good personal health management habits; on cluster oral care system can help caregivers to improve care skills; on cluster oral care can help the person being served to reduce the frequency of hospital visits; on cluster oral care can help reduce national health insurance expenditure; and, on nurses participating in cluster oral care must have excellent communication skill; while on cluster oral care can help the person being served to save time in hospital-consultation, were slightly higher than the neutral

value, most people are a little more positive; and, on cluster oral care play very important roles to nurses mostly believe that cluster oral care is effective for nurses.

Table 3. Descriptive analysis of respondents' views of head and neck malignancies.

Perceptions Regarding Head and Neck Malignancies	Average Value
Perception of Oral Mucositis	
1. To what extent are you familiar with oral mucositis?	3.3
2. To what extent are you familiar with the related preventive measures of oral mucositis?	3
3. To what extent are you familiar with the causes of oral mucositis?	3.2
4. To what extent are you familiar with oral mucositis in China?	3.2
5. To what extent are you familiar with oral mucositis in other countries?	3
Perception of oral cancer	
1. In your opinion, is proper oral care beneficial to patients?	3.5
2. In your opinion, is oral cancer treatment costly?	3.3
3. In your opinion, is the occurrence of oral cancer related to smoking?	3.3
4. In your opinion, is the occurrence of oral cancer related to long-term oral chronic inflammation?	3.3
5. In your opinion, is oral cluster care can save nurses' time?	3.2
6. In your opinion, is oral cluster care effective in improving patient condition?	3.3
7. In your opinion, can drinking alcohol lead to oral cancer?	3.3
Perception on managing oral mucositis	
1. In your opinion, the stimulation of poor prostheses is the cause of oral cancer?	3.3
2. In your opinion, does chemoradiotherapy for oral cancer patients cause psychological harm to the patient?	3.2
3. In your opinion, does chemoradiotherapy endanger patient physical and mental health?	3.2
4. In your opinion, does telemedicine technology result in unauthorized access to patient medical information?	3.2
5. In your opinion, chronic inflammation and repeated stimulation can induce oral cancer?	3.2
Perceptions of oral cancer on its factor influences oral hygiene	
1. In your opinion, patients with radiotherapy for oral cancer should be instructed to use a soft bristle toothbrush to clean their teeth?	3.4
2. In your opinion, patients should be instructed to eat soft or liquid food with light and easy digestion, high protein, and high vitamins, and avoid spicy diet to reduce irritation and injury to oral mucosa?	3.2
3. In your opinion, patients should be instructed to gargle after getting up and before going to bed with normal saline or a doctor's mouthwash?	3.3
4. In your opinion, patients should be instructed to gargle before and after eating with normal saline or a doctor's mouthwash?	3.3
5. In your opinion, patients should be instructed to gargle after vomiting with normal saline or doctor's mouthwash?	3.3

Table 4. Respondent's attitudes towards the cluster care system

The attitude towards Cluster Oral Care Nursing.	Mean	Standard Deviation
1. I think that cluster oral care achieves effective prevention of oral mucositis in patients with head and neck tumors during radiotherapy.	3.4	1.1
2. I think cluster oral care can provide accurate information on oral care.	3.3	1.9
3. I think cluster oral care helps not to aggravate the severity of oral mucositis.	3.1	1.9
4. I think the ability of cluster oral care for head and neck tumor radiotherapy patients is promising to achieve effective prevention of oral mucositis in the course of radiotherapy for head and neck tumor patients.	3	0.8
5. I think that the cluster oral care can help in increasing work efficiency.	4	1.9
6. I think that nurses involved in cluster oral care must be familiar with the use of the cluster oral care system	3	1.8
7. I think that an easy-to-learn and easy-to-use cluster oral care is very important for telenursing.	3.1	0.8
8. I think that cluster oral care would assist people with disabilities, older adults, and patients with chronic diseases.	3	0.8
9. I think that the cluster oral care can help the person being served to carry out self-care in their home or the living environment they are familiar with.	3	0.9
10. I think that cluster oral care can help the person being served with the ability to self-manage and consequently in controlling health issues (e.g. blood pressure, blood glucose, etc).	3	0.9
11. I think that cluster oral care can help the person being served to develop good personal health management habits.	3	0.8
12. I think that the cluster oral care system can help caregivers improve their care skills	3	1.8
13. I think that the cluster oral care can help the person being served to reduce the frequency of hospital visits.	3	0.9
14. I think that cluster oral care can help the person being served to save time in hospital consultation	3	0.9
15. I think the cluster oral care can help reduce national health insurance expenditure.	3	0.8
16. I think that cluster oral care plays a very important role in nurses	3	1.9
17. I think that nurses participating in cluster oral care must have excellent communication skill.	3	1.8

Difference of the respondents' perceptions regarding head and neck malignancies and attitude towards cluster oral care nursing when grouped according to demographic variables (Table 5-12): it has a significant difference between the two genders, males had significantly higher mean perception and attitude scores than females; no significant difference in perception and attitude between the two age groups; there were significant differences between respondents with different educational levels, this suggests that academic qualifications may have an impact on respondents' perceptions and attitude, and that respondents with PhD qualifications may tend to have more positive perceptions and attitude; no significant difference in perceptions between the two employment status, that regular and contractual workers have similar scores on perception and attitude; a significant difference between the ranges of how many years of experience and that as the years of experience increased, the individuals' perceptions and attitudes scores also showed a gradual increase; there were differences in perception and attitude scores among respondents from different wards or departments, this suggests that the characteristics of different units/departments and environments may have a significant impact on respondents' perceptions and attitudes;

Table 5. Differential Analysis of Perceptions and Attitudes by Sex

	Sex (mean ± standard deviation)		t	p
	Male (n=2)	Female (n=68)		
Perception	3.800±0.071	3.247±0.569	6.485	0.000***
Attitude	3.430±0.127	3.021±0.599	3.536	0.045*

Table 9. Differential Analysis of Perceptions and Attitudes by Years of Experience

	Years of experience (mean ± standard deviation)					F	p
	Up to 5 years (n=10)	6-10 years (n=35)	11-15 years (n=9)	16-20 years (n=11)	More than 20 years (n=5)		
Perception	2.381±0.276	3.066±0.265	3.792±0.074	3.919±0.032	4.010±0.022	99.677	0.000***
Attitude	2.664±0.609	2.791±0.553	3.444±0.352	3.548±0.112	3.592±0.145	10.263	0.000***

Table 10. Differential Analysis of Perceptions and Attitudes by Departments

	Unit/sector (mean ± standard deviation)					F	p
	Head, neck and abdomen cancer ward (n=18)	Pelvic cancer ward (n=21)	Second chest cancer ward (n=12)	First chest cancer ward (n=12)	Invasive cancer ward (n=7)		
Perception	3.903±0.141	2.944±0.314	2.947±0.602	3.144±0.434	2.962±0.458	18.546	0.000***
Attitude	3.508±0.252	2.486±0.382	2.975±0.729	3.067±0.570	2.785±0.171	9.739	0.000***

Table 11. Differential analysis of the Number of capacity building activities for head and neck malignancies in terms of perceptions and attitudes

	Number of capacity building activities for head and neck malignancies (mean ± standard deviation)			F	p
	0 (n=6)	1 (n=45)	3 (n=19)		
perception	3.248±0.382	3.242±0.589	3.317±0.590	0.114	0.892
attitude	2.917±0.422	2.978±0.642	3.201±0.505	1.069	0.349

Table 12. Analysis of variability in perceptions and attitudes of the Number of trainings about cluster oral care nursing

	Number of cluster care training (mean ± standard deviation)		t	p
	0 times (n=50)	6 (n=20)		
Perception	3.248±0.570	3.300±0.579	-0.342	0.733
Attitude	2.973±0.623	3.181±0.499	-1.332	0.187

no significant difference in perception and attitude between groups with different numbers of head and neck malignancies; no significant difference in perception and attitude between the number of nursing training across clusters.

Table 6. Differential Analysis of Perceptions and Attitudes by Age

	Age (mean ± standard deviation)		t	p
	20-44 years (n=66)	45-64 years (n=4)		
Perception	3.274±0.568	3.075±0.629	0.678	0.5
Attitude	3.041±0.603	2.895±0.464	0.475	0.636

Table 7. Differential Analysis of Perceptions and Attitudes by Highest Educational Attainment

	Highest Level of Education (mean ± standard deviation)			F	p
	BSN (n=33)	MAN (n=24)	PhD (n=13)		
Perception	3.071±0.572	3.347±0.511	3.596±0.501	4.864	0.011*
Attitude	2.821±0.628	3.075±0.515	3.493±0.336	7.132	0.002**

Table 8. Differential Analysis of Perceptions and Attitudes by Status of Employment

	Status of Employment (mean ± standard deviation)		t	p
	Regular workers (n=6)	Contractual workers (n=64)		
Perception	3.123±0.251	3.276±0.589	1.211	0.251
Attitude	2.943±0.471	3.041±0.607	0.384	0.702

Correlation between perceptions and attitudes (Table 13): there is a moderately strong positive correlation between perceptions and attitudes, this means that respondents who held positive perception were more likely to hold positive attitudes.

Table 13. Relationship of the respondents' perceptions regarding head and neck malignancies and attitudes towards cluster care nursing.

		Attitude
Perception	Pearson Correlation	.624**
	Sig. (2-tailed)	.000
	N	70

** . Correlation is significant at the 0.01 level (2-tailed).

3. Discussion

Nurses had a positive attitude towards the cluster care system, and believed that the clustered oral care system helped to reduce the severity of oral mucositis and improve the quality of life of patients, also hold a positive attitude towards the implementation of the cluster oral care system, believing that the cluster care system can improve the nurses' communication ability and work efficiency. Found that male, years of experience, educational level, and unit/ department assignment has significant difference, while age, employment status, number of nursing training in different clusters, and number of capacity-building activities for head and neck malignancies found no significance in terms of perceptions on head and neck malignancies and attitudes toward cluster oral care nursing.

4. Conclusion

The results show that nurses have a more positive perception on head and neck malignancies and cluster oral care, believing that the cluster care system can effectively prevent oral mucositis, provide accurate oral care information, reduce the severity of oral mucositis, and improve the quality of life of patients. There is a moderately strong positive correlation between perceptions and attitudes, this means that respondents in the sample who held positive perceptions were more likely to hold positive attitudes. Meanwhile, the study also found a certain correlation between the nurse's perception of head and neck malignancies and attitudes toward cluster oral care nursing and the effectiveness of the cluster care system.

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References

[1] Cardoso, D., Couto, F., Ana Filipa Cardoso, Elzbieta Bobrowicz-Campos, Luisa dos Santos, Rodrigues, R., Dias, R., Pinto, D., Ramis, M., Manuel Alves Rodrigues, & João Apóstolo. (2021). The Effectiveness of an Evidence-Based Practice (EBP) Educational Program on Undergraduate Nursing Student' EBP Knowledge and Skills: A Cluster Randomized Control Trial. *International Journal of Environmental Research and Public Health*, 18(1), 293–293. <https://doi.org/10.3390/ijerph18010293>.

[2] Dhopte, A., & Bagde, H. (2022). Comparative Evaluation of Low-Level Laser Therapy and Topical Triamcinolone Acetonide 0.1% in Recurrent Aphthous Stomatitis Subjects. *Cureus*. <https://doi.org/10.7759/cureus.25564>.

[3] Iovoli, A. J., Turecki, L., Qiu, M. L., Khan, M., Smith, K. M., Yu, H., Jun, S., Farrugia, M., & Singh, A. (2023). Severe Oral Mucositis After Intensity-Modulated Radiation Therapy for Head and Neck.

[4] Liu, C. (2022). Clinical study of self-prepared Qingyan Jiedu Decoction for prevention and treatment of oral cancer acute radiation oral mucositis (Doctor dissertation, Hunan University of Chinese Medicine).

[5] McLachlan, S., Evangelia Kyrimi, Dube, K., Hitman, G. A., Simmonds, J. A., & Fenton, N. (2020). Towards standardisation of evidence-based clinical care process specifications. *Health Informatics Journal*, 26(4), 2512–2537. <https://doi.org/10.1177/1460458220906069>.

[6] Peng, T., Tsai, F.-P., & Wu, T. (2022). Effects of various treatments for preventing oral mucositis in cancer patients: A network Meta-analysis. *PLOS ONE*, 17(12), e0278102–e0278102. <https://doi.org/10.1371/journal.pone.0278102>.

[7] Pereira, I. F., Firmino, R. T., Meira, H. C., DO Egito Vasconcelos, B. C., DE Souza Noronha, V. R. A., & Santos, V. R. (2019). Radiation-induced Oral Mucositis in Brazilian Patients: Prevalence and Associated Factors. *Mucositis in Brazilian Patients: Prevalence and Associated Factors. In vivo (Athens, Greece)*, 33(2).

[8] Pulito, C., Cristaudo, A., Caterina, Stefano Zapperi, Blandino, G., Morrone, A., & Strano, S. (2020). Oral mucositis: the hidden side of cancer therapy. *Journal of Experimental & Clinical Cancer Research*, 39(1). <https://doi.org/10.1186/s13046-020-01715-7>.

[9] Sonis, S. T. (2022). Precision medicine for risk a prediction of oral complications of cancer therapy–The example of oral mucositis in patients receiving radiation therapy for cancers of the head and neck. *Frontiers in Oral Health*, 3.

[10] Sun, Y., Li, X., Cai, Q., Wang, M., Wang, X., Wang, S., & Ni, Z. (2022). Research progress on the pharmacological effects of matrine. *Frontiers in Neuroscience*, 16. <https://doi.org/10.3389/fnins.2022.977374>.

[11] Wang, C., Wang, P., Ouyang, H., Wang, J., Sun, L., Li, Y., Li, D., Jiang, Z., Wang, B., & Pan, Z. (2017). Efficacy of Traditional Chinese Medicine in Treatment and Prophylaxis of Radiation-Induced Oral Mucositis in Patients Receiving Radiotherapy: A Randomized Controlled Trial. *Integrative Cancer Therapies*, 17(2), 444–450. <https://doi.org/10.1177/1534735417725578>.

[12] Wang, G., Cheng, X., Zhang, M., Bi, W., Feng, J., & Jiang, N. (2021). Effect of self-made green tea solution on prevention and treatment of radioactive oral mucositis in patients with head and neck tumor. *Chinese Medical Abstracts (Otolaryngology)*, 37(04), 49–51.

[13] Winter, C., Keimel, R., Gugatschka, M., Kolb, D., Gerd Leitinger, & Roblegg, E. (2021). Investigation of Changes in Saliva in Radiotherapy-Induced Head Neck Cancer Patients. *International Journal of Environmental Research and Public Health*, 18(4), 1629–1629. <https://doi.org/10.3390/ijerph18041629>.

[14] Wu, C., Liu, Y., Shi, F., Chen, F., Zhao, Y., & Zhao, H. (2022). The relationship of serum gastrin-17 and oral mucositis in head and neck carcinoma patients receiving radiotherapy. *Discover Oncology*, 13(1).

[15] Yuan, H., Su, J., Tan, J., & Wei, Y. (2022). Efficacy of kangfuxin liquid on radiotherapy induced oral mucositis for patients with head and neck squamous cell carcinoma and its effect on salivary glands and immune function. *American Journal of Translational Research*, 14(9), 6792–6804. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9556508/>.