

“A study to assess the effect of turmeric mouthwash on oral mucositis among patients receiving chemotherapy”.

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ABSTRACT.

Oral mucositis is a common, painful inflammation and ulceration of the mouth's mucous membranes, often occurring as a side effect of cancer treatment (chemotherapy or radiation). It causes severe mouth pain, difficulty eating/speaking, and increases infection risk. Management involves strict oral hygiene, pain relief, and dietary changes. Chemotherapy-treated cancer patients may experience an acute dose-limiting effect called oral mucositis (OM).

Sepsis is a major cause of death and is characterized by severe erythema, ulceration, and inflammation. Infections with bacteria and fungi can occur in patients with OM. The etiology of OM is multifaceted. Owing to myelosuppression and the toxicity of chemotherapy and radiation therapy on oral epithelial cells, there is an imbalance in cell turnover that results in thin, atrophied epithelium and ulceration. OM begins 3–5 days in advance and lasts during 5–6 weeks of chemotherapy²

Objectives:

- To assess the existing grade of oral mucositis in experimental and control group.
- To assess the grade of oral mucositis after turmeric mouthwash in experimental and control group.
- To compare the postassessment scores in experimental and control group.

Materials and Methods:

Study was conducted by using Quasi- experimental pre-test –post-test research design to assess the effect of turmeric mouthwash on oral mucositis among patients receiving chemotherapy in selected cancer hospitals. 60 samples were selected by using non- probability purposive sampling method Pre-test was conducted on first day by using observation check-list for oral mucositis in experimental group and control group. From same day turmeric mouthwash was given twice a day (at morning and evening) for seven days. Post-test was conducted on 8th day in experimental group and control group by using observation check-list for oral mucositis Analysis was done using frequency and percentage distribution and paired test.

Results:

Existing condition of Oral mucositis was assessed with help of observation check- list for oral mucositis. In experimental group mean score was 2.6 and in control group 4.96. In experimental group standard deviation was 1.303 and in control 1.771

Conclusion:

Significant difference was found after mouth wash on oral mucositis in experimental group value is less than 0.005 so turmeric mouth wash was effective in oral mucositis.

Keywords- Effectiveness, Oral Mucositis, Turmeric Mouth Wash

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BACK GROUND OF THE STUDY

Since cancer is associated with both mortality and a reduced quality of life, it continues to be one of the most feared diseases even with improvements in early detection and effective treatment. While new discoveries into the causes and treatments of cancer are being made, attempts to control the disease's symptoms and related therapies have lagged behind. Out of all neoplasms, cancer is the fifth

most frequent, with at least 500,000 new cases recorded annually. Of these, 25% occur in the larynx, 15% in the pharynx, 40% in the oral cavity, and 7% in the salivary glands. The treatment plan calls for the use of radiation, chemotherapy, and surgery either concurrently or sequentially.¹

It is projected that over 1.5 million individuals in India will get chemotherapy in 2024.

This figure illustrates the substantial cancer burden in the nation, where the disease is becoming more common as a result of a

number of reasons including population aging, changing lifestyles, and growing urbanization. [oai_citation:1, Evidence from 12,148 patients in the Indian database about health-related quality of life and its determinants among cancer patients | Health and Quality of Life Outcomes.³

India faces a significant cancer burden, and Maharashtra, being one of the most populous and urbanized states, has a substantial number of cancer patients. Nationwide, the demand for chemotherapy is increasing due to the rising incidence of cancer. For instance, globally, the number of patients needing first-line chemotherapy is expected to increase significantly from

9.8 million in 2018 to 15 million by 2040, with much of this increase occurring in countries like India⁴

Oral mucositis is a common side effect of anticancer treatment that reduces the effectiveness of therapy by raising healthcare expenditures, requiring patients to take smaller doses, and negatively affecting their quality of life. A multinational interdisciplinary panel of specialists was created by the International Society for Oral Oncology and the Multinational Association of Supportive Care in Cancer to develop clinical practice guidelines for the diagnosis, management, and prevention of mucositis⁵

One common side effect of cytoreductive cancer treatment is oral mucositis. Mucositis is a clinically significant risk factor for sepsis in cancer patients who are neutropenic; in many cases, it is linked with severe pain, which can drastically lower quality of life. Additionally, it can become a dose-limiting hazard in some individuals, which slows down or stops the progression of some cancer therapies, such as combined chemotherapy and radiation with accelerated and hyperfractionation.⁶

There is a lack of consensus regarding the role of oral commensal microorganisms in the initiation or progression of mucositis because relevant experimental models are non-existent. The goal of this study was to develop an in vitro mucosal injury model that mimics chemotherapy-induced mucositis, where the effect of oral commensals can be studied.⁷

Oral candidiasis is one type of fungus that causes acute disturbance of the integrity and function of the oral mucosa, manifesting as redness to severe ulceration. Radiation therapy frequently causes oral mucositis in up to 80% of patients, high dosage chemotherapy in up to 100% of patients, and standard chemotherapy in up to 20–40% of patients. All of these treatments cause atrophy of the mucosal lining of the mouth,

which is followed by the formation of ulcers. After two weeks of starting radiation therapy, mouth sores with erythema appear, and the next two weeks see substantial damage to the epithelium. Concurrent chemotherapy and radiation therapy further increases the frequency and severity of OM. These cancer therapies have side effects that might be painful or irritating to the mouth, like trouble eating and swallowing, bleeding, decreased nutrition that causes weight loss, postponing cancer therapy, and prolonged.⁸

Herbal medicine is needed, preferably with a range of pharmacological benefits and little side effects. The substance that acts of turmeric (*Curcuma longa*), a member of the Zingiberaceae family, is curcumin. Turmeric contains qualities that make it an excellent wound healer, chemo sensor, analgesic, anti-inflammatory, antibacterial, and radiosensitive. Research has demonstrated that turmeric/curcumin is beneficial in treating potentially malignant disorders such as oral sub mucous fibrosis and oral lichen planus. It has additionally shown efficacy against proinflammatory cytokines, cyclooxygenase, and prostaglandin E. Turmeric is a leading ingredient in wound healing.⁹

Turmeric mouthwash is a natural oral hygiene product that harnesses the properties of turmeric for dental care. It typically contains turmeric extract or oil, along with other ingredients like water, essential oils, and sometimes alcohol. Turmeric's antimicrobial properties can help combat bacteria in the mouth, while its anti-inflammatory properties may soothe gum irritate and promote oral health. However, scientific evidence supporting the effectiveness of turmeric mouthwash is still limited, and more research is needed to fully understand its benefits. As with any oral hygiene product, it's essential to use turmeric mouthwash as directed and consult with a dentist if you have any concerns about your oral health.¹⁰

NEED FOR STUDY:

Oral mucositis, a painful inflammation and ulceration of the oral mucosa, is a prevalent and debilitating side effect experienced by 50-100% of patients undergoing chemotherapy. This condition significantly impacts quality of life, causing pain, difficulty eating and speaking, and increasing the risk of infection.¹⁰ Mucositis is a painful inflammation and ulceration of the mucous membranes, which is usually a side effect of cancer chemotherapy. Mucositis can limit the patient's ability to tolerate chemotherapy (CT) and nutritional

status is compromised.¹¹

This can significantly affect cancer treatment and the patient's quality of life. The frequency and severity of mucositis varies between patients and therapies. The incidence of mucositis in patients receiving conventional chemotherapy is estimated to be 40%, and in addition to increasing the number of treatment cycles, there are a number of problems including pain, nutritional problems due to the inability to eat and an increased risk of infection due to open mucosal wounds. This has a significant impact on the patient's quality of life and can be dose-limiting.¹²

Acute morbidity associated with chemotherapy – induced oral mucositis is observed in individuals receiving treatment for head and neck malignancies. In this investigation we assessed the effectiveness of turmeric on averting mucositis caused by chemotherapy.¹³

Potential Benefits of Turmeric: Due to its antibacterial and anti-inflammatory qualities, turmeric has long been used. Research has indicated that it may have the ability to promote wound healing and decrease inflammation, which makes it a good option for treating oral mucositis. **Cost-Effectiveness** Considering that turmeric is generally accessible and reasonably priced, it may prove to be a more economical choice for treating oral mucositis than alternative therapies that can be more costly or call for specialist equipment.¹⁴

Gap in Scientific Evidence Although there is some evidence from in vitro and animal research to support the use of turmeric for oral mucositis, there aren't many well-designed clinical trials to support the herb's safety and effectiveness in people. A study would assist in addressing this void in the body of knowledge.¹⁵

Effect on Life Quality Patients with oral mucositis may have pain, discomfort, trouble eating and swallowing, and speech impairment, all of which can lower their quality of life. The effectiveness of cancer treatment may be compromised in severe cases if dose adjustments or treatment pauses are necessary. **Difficulties Treatment delays, malnourishment, dehydration, secondary infections, and other consequences can worsen patients' health and well-being if oral mucositis goes untreated.** Researching oral mucositis aids in the development of management and prevention plans for these issues.¹⁶

Turmeric is one of nature's most powerful healers. Turmeric has been used in India for over 2,500 years. A study by Ayyaluswamy Ramamurthy at the

University of Michigan (2009) showed that curcumin in turmeric helps regulate cells by anchoring to the cell membrane and disrupting molecular pathways that lead to infections and even cancer.¹⁷

The active ingredient in turmeric is curcumin. Curcumin is often recommended to protect healthy cells from the harmful effects of chemotherapy without reducing the effectiveness of their treatment. Numerous acute and long-term symptoms of oral mucositis have been linked to significant reductions in quality of life. Eating, drinking, swallowing, speaking, and even sleeping might become difficult due to the pain caused by mucositis. These consequences may then result in anorexia, cachexia, dehydration, weight loss, and the requirement for parenteral feeding.¹⁷

RESEARCH METHODOLOGY:

The current research aimed to assess the effect of turmeric mouthwash on oral mucositis among patients receiving chemotherapy in selected cancer hospitals. In the study Quasi- experimental pre-test post-test with control group design and quantitative research approach is used with non-probability purposive sampling technique is used. 60 samples were selected as per the criteria. (30 in experimental group and 30 in control group) The researcher collected demographic data. Oral mucositis assessed by using observation check list both in experimental and control group. In experimental group turmeric mouth was given for seven days twice daily. On 8th day post assessment is done. The research was approved by the ethical committee after presenting proposal with data collection tool. Tool consist of

Section I-Demographic variables

Section II-Observation check- list for oral mucositis.

The reliability of the tool was determined by observation check-list. Inter-rater method was used to check the tool reliability. The reliability coefficient $r=0.89$, which is more than 0.7 hence the tool was found to be reliable. Pilot study was conducted for the feasibility of the study.

Data was analysed according to the objectives:

- Section-I- frequency and percentage distribution of socio-demographical variables.
- Section-II- Analysis of data related to level oral mucositis before intervention of turmeric mouth wash in experimental and control group.

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- Section-III- Analysis of data related to level of oral mucositis after intervention of turmeric mouth wash in experimental and control group.
- Section IV-Comparison of the post assessment scores in experimental and control group.

TABLE NO. 1: Frequency and percentages distribution of Demographic Variables.
n= 30+30

	Demographic Variables		Experimental Group		Control Group	
			F	%	F	%
	Age (in years)	30	6	20%	7	23%
		—				
		40				
		41	7	23%	6	20%
		—				
		50				
		51	10	34%	11	37%
		—				
		60				
		61 & above	7	23%	6	20%
	Gender	Male	16	53%	13	43%
		Female	14	47%	17	57%
	Cancer	St	7	23%	6	20%

	stage	age	%		%	
	1	St age - 2	8	27%	9	30%
		St age - 3	9	30%	8	27%
		St age - 4	6	20%	7	23%
		St age - 5	7	23%	5	17%
	No. of chemotherapy cycle	10	11	37%	10	33%
		11	11	37%	10	33%
		15	6	20%	7	23%
		20				

Result In experimental group, as per age among the 6 (20%) were in age group 30 - 40, 7 (23%) in age group 41 – 50, 61 and above, 10 (34%) in age group 51 – 60. In control group, 7 (23%) were in age group 30 - 40, 6 (20%) in age group 41 – 50, 61 and above, 11 (37%) in age group 51 – 60. In experimental group, as per gender 16 (53%) were

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male and 14 (47%) female . In control group, 13 (43%) were male and 17 (57%) were female .In experimental group, as per cancer stage 7 (23%) had 1st stage, 8 (27%) had 2nd stage, 9 (30%) had 3rd stage and 6 (20%) had 4th stage of cancer. In control group, 6 (20%) had 1st stage, 9 (30%) had 2nd stage, 8 (27%) had 3rd stage and 7 (23%) had 4th stage of cancer

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In experimental group, as per no.of chemotherapy cycle 6 (20%) undergone through 0 – 5 cycles, and 16– 20 chemotherapy cycle, 7 (23%) undergone through 6 – 10 chemotherapy cycle and 11 (37%) undergone through 11 – 15 chemotherapy cycle. In control group, 8 (27%) undergone through 0 – 5, 5 (17%) undergone through 6 – 10, 10 (33%) undergone through 11 – 15 chemotherapy cycle and 7 (23%) undergone through 16 – 20 chemotherapy cycle.

Table No.2: Assessment level of oral mucositis before turmeric mouthwash in experimental and control group.
n = 30+30

L ev el	Experimen tal group		Control group	
	F	%	f	%
(1 – 3) m il d	2 2	7 3 %	9	3 0 %
(4 – 6) m od er at e	8	2 7 %	1 4	4 7 %
(7 – 10) se ve re	0	0 %	7	2 3 %

Result: The above table shows that oral mucositis grade before administration of turmeric mouth wash in experimental and control group. 2 (7%) patient in experimental group and 7 (23%) in control group has mild grade mucositis. 18 (60%) patient in experimental group and control group has moderate grade mucositis. 10 (33%) patient in experimental group and 5 (17%) in control group has severe grade mucositis.

Table No.3: Assessment level of oral mucositis after turmeric mouthwash experimental and control group.
n=30+30

L ev el	Experimen tal group		Control group	
	F	%	f	%

(1 – 3) m il d	2 2	7 3 %	9	3 0 %
(4 – 6) m od er at e	8	2 7 %	1 4	4 7 %
(7 – 10) se ve re	0	0 %	7	2 3 %

Result: The above table shows that oral mucositis grade after administration of turmeric mouth wash in experimental and control group. 22 (73%) patient in experimental group and 9 (30%) in control group has mild grade mucositis. 8 (27%) patient in experimental group and 14 (47%) control group has moderate grade mucositis. 7 (23%) in control group has severe grade mucositis.

Table No.4: Comparison of the post assessment level in experimental and control group.
n=30=30

Pos t- asse ssment	M e a n	S . D .	t - v a l u e	p - v a l u e	Sig nifi cance
Exp eri me ntal Gro up	2 . 6	1 . 3 0 3	5 . 8 9 6 2	0. 0 0 0 1 <	Sig nifi cant
Co ntr ol Gro up	4 . 9 6	1 . 7 7 1		0. 0 5	

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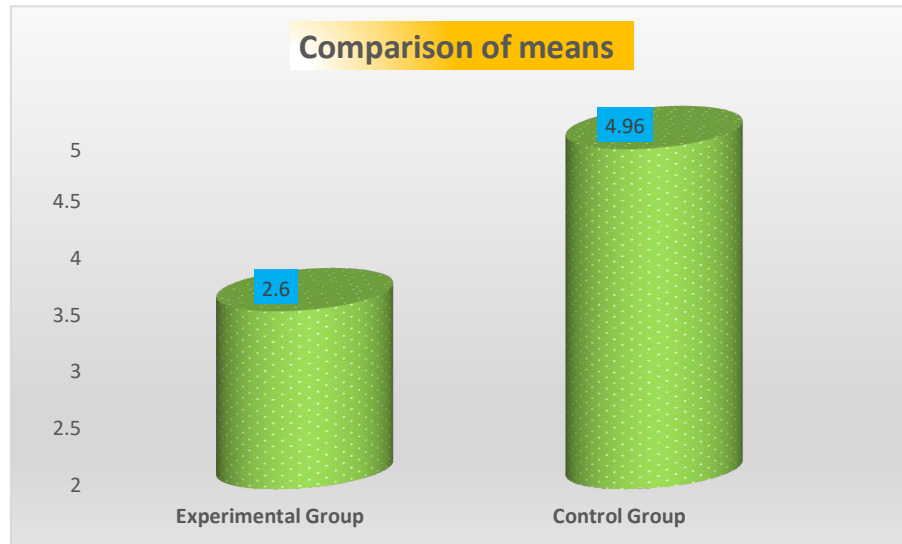


Figure no.1 comparison of mean in experimental and control group

Result: On day 7, after turmeric mouth wash on oral mucositis mean was 2.6, and S.D. was 1.303 in experimental group and in control group mean was 4.96, and S.D. was 1.771 and t-value was 5.8962 and p-value was $0.00001 < 0.05$. Since the test is statistically significant according to day 7 between experimental and control group at 5% level of significance

DISCUSSION:

The present study intended to find out the effectiveness of turmeric mouthwash on oral mucositis among patient receiving chemotherapy in selected cancer hospitals of Sangli, miraj and kupwad Corporation area. The findings of the present study are discussed with reference to the objectives, hypothesis stated and with findings of other similar studies.

Conclusion This study demonstrate that turmeric mouthwash was effective in treating mucositis in patient receiving chemotherapy. after turmeric

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mouth wash on oral mucositis mean was 2.6, and S.D. was 1.303 in experimental group and in control group mean was 4.96, and S.D. was 1.771 and t-value was 5.8962 and p-value was $0.00001 < 0.05$. Since the test is statistically significant according to day 7 between experimental and control group at 5% level of significance. This study was conducted in small scale due to time limitation. Researcher can conduct this study with a large sample size in order to generalize the results. as a researcher, promote more research on effective management for mucositis patients with .The further study can be conducted on large scale and different settings. A similar study may be conducted using turmeric mouth in other chronic inflammatory conditions to assess its broader applicability.

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