A STUDY TO ASSESS THE EFFECTIVENESS OF HONEY MOUTH WASH ON RADIATION INDUCED ORAL MUCOSITIS AMONG PATIENT WITH HEAD AND NECK CANCER AT SELECTED HOSPITAL, COIMBATORE

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ABSTRACT

Introduction: Radiation-induced oral mucositis is a frequent complication in head and neck cancer patients undergoing radiotherapy, often causing pain and treatment delays. This study evaluated the effectiveness of honey mouthwash in reducing mucositis severity. **Aim:** To determine the therapeutic effect of honey mouthwash on radiation-induced oral mucositis. **Methods:** A quasi-experimental pretest–post-test control group design was conducted at Ashwin Hospital, Coimbatore. Sixty patients were purposively assigned to experimental (honey mouthwash) and control (routine care) groups. Mucositis severity was assessed using the Oral Mucositis Grading Scale. The experimental group used a rinse of 20 mL honey in 200 mL water, held for 30 seconds twice per rinse, thrice daily after meals for six days. Post-test severity was reassessed, and data were analysed with descriptive and inferential statistics. **Results:** Honey mouthwash significantly reduced mucositis severity. Post-test, 20% of the experimental group were mucositis-free, with no severe cases, whereas 43.3% of controls developed very severe mucositis. Mean scores decreased from 1.90 to 1.07 in the experimental group but increased from 2.57 to 3.13 in controls ($t = 8.46$, $p \leq 0.001$). **Conclusion:** Honey mouthwash is a safe, natural, and effective supportive measure for reducing radiation-induced oral mucositis in head and neck cancer patients.

KEYWORDS: Honey mouthwash, Radiation, Oral mucositis, Supportive therapy.

INTRODUCTION

Cancer is a major global health challenge, causing nearly 10 million deaths annually. In India, 2020 estimates reported 679,421 cases in men and 712,758 in women, with head and neck cancers (HNCs) accounting for about 30%—among the highest worldwide, largely linked to tobacco and alcohol use. Radiotherapy, a primary treatment, commonly causes oral mucositis (OM), affecting over 80% of patients and severely impacting nutrition, speech, treatment continuity, and quality of life. Existing OM treatments are often costly, less effective, or carry side effects, making natural alternatives attractive. Honey, with its anti-inflammatory, antioxidant, antimicrobial, and healing properties, has shown promise in reducing OM severity, improving oral comfort, and preventing complications. This study evaluates the effectiveness of honey mouthwash in managing radiation-induced OM, aiming to provide a cost-effective, integrative strategy to improve outcomes in HNC patients.

Statement of the problem

A study to assess the effectiveness of honey mouth wash on radiation induced oral mucositis among patient with head and neck cancer at selected hospital, Coimbatore.

OBJECTIVES

- To assess the level of radiation induced oral mucositis among patients with head and neck cancer in experimental and control group.
- To evaluate the effectiveness of honey mouth wash on level of radiation induced oral mucositis among patients with head and neck cancer in experimental and control group.
- To associate between pretest level of radiation induced oral mucositis among patients with head and neck cancer and with their selected socio demographic variables and clinical variables in experimental and control group.

Operational Definition

- **Assess:** This study refers to the measurement of posttest level of oral mucositis among patient with head and neck cancer undergoing radiation therapy as measured by Oral mucositis grading Scale.

- **Effectiveness:** It refers to the outcome of honey mouthwash on level of radiation induced oral mucositis among patient with head and neck cancer in experimental group.

- **Honey mouth wash**: It refers to a therapeutic oral rinse prepared by mixing 20 mL of pure honey with 200 mL of clean water. The resulting solution is divided into two equal portions. Each portion is used by holding it in the mouth for 30 seconds (total contact time of 60 seconds) before spitting it out. This procedure is carried out three times a day, specifically after each meal, for a duration of 6 days in order to maintain consistency and maximize therapeutic effectiveness.

- **Radiation induced Oral mucositis**: Oral mucositis is the inflammation, erythema, and ulceration of the oral mucosa caused by radiation therapy in head and neck cancer patients. It is assessed through clinical signs and symptoms like pain, difficulty eating or swallowing, and visible lesions, using the WHO Oral Mucositis Grading Scale.

- **Head and Neck Cancer**: It refers to malignant tumors classified as stage I to IV located in the oral cavity, pharynx, or larynx and diagnosed by a qualified oncologist through clinical evaluation and confirmed by histopathological examination

Hypotheses

H_1: There is a significant difference in post test score on level of radiation induced oral mucositis among patients with head and neck cancer in experimental and control group.

H_2: There is a significant association between the pretest level of radiation induced oral mucositis among patients with head and neck cancer in experimental and control group with their selected demographic variables and clinical variables.

Assumption

- Honey is cytotoxic to cancer cells but safe for normal cells.

- It inhibits carcinogenesis by modulating initiation, promotion, and progression stages, thereby reducing radiation-induced oral mucositis in head and neck cancer patients.

Delimitation

The study is delimited to:

- Patients with stage I–IV head and neck cancer undergoing radiation therapy.

- Data collection period of 30 days.

Projected Outcome

Honey mouthwash will reduce the severity of radiation-induced oral mucositis among head and neck cancer patients.

Conceptual Framework -Modified Roy's Adaptation Model (1999) was adopted in this study.

REVIEW OF LITERATURE

Tunzi et al., (2022) conducted a systematic review of four randomized controlled trials involving 500 head and neck cancer patients to determine the optimal frequency of individualized nutrition counselling (INC). Weekly INC during treatment and fortnightly sessions post-treatment significantly improved nutritional status, quality of life, and reduced morbidity. However, fortnightly INC during treatment showed no significant benefits for adherence, dietary intake, or weight stabilization. The review recommends further studies on pre-treatment counselling and post-treatment support duration.

Sharma et al., (2024) conducted a study looked into the effectiveness of probiotics in lowering radiation-induced oral mucositis (RIOM) in patients with head and neck cancer undergoing radiotherapy. The sample consisted of 100 patients, and oral health exams and microbiota analysis were carried out. The findings demonstrated that probiotics greatly reduced the incidence and severity of RIOM by restoring the balance of oral flora. The study concluded that probiotics are an effective preventive strategy for managing RIOM, improving both oral health and the overall quality of life for cancer patients receiving radiotherapy.

Al Jaouni et al., (2024) conducted a clinical trial with 60 head and neck cancer patients receiving radiotherapy to evaluate honey mouthwash for radiation-induced oral mucositis (RIOM). Participants were assigned to either a honey mouthwash group or a placebo group, with mucositis severity, pain, and mucosal healing monitored. Honey mouthwash significantly reduced mucositis severity, accelerated healing, and lessened pain and discomfort compared to placebo. The authors concluded it is an effective, affordable option to improve quality of life in these patients.

MATERIALS AND METHODS

- **Research Approach:** A quantitative approach was adopted.

- **Research Design and Settings:** A quasi-experimental pre-test post-test control group design was used in the Oncology Department, Ashwin Hospital, Coimbatore.

- **Population:** Target population was all head and neck cancer patients on radiation therapy. Accessible population was those who developed radiation-induced oral mucositis at the study site.

- **Sampling& sample size:** Non probability, Purposive sampling was used with 60 patients (30 in experimental group, 30 in control group).

Criteria for Sample Selection

Inclusion criteria

- Patients diagnosed with HNC and undergoing radiotherapy.

- Patients with WHO mucositis grades I–IV.

- Both male and female patients.

- Hospitalized for at least 2–3 weeks.

- Willing to participate and provide informed consent.

Exclusion criteria

- Patients with uncontrolled diabetes mellitus.

- Patients with tracheostomy tubes or critical illness.

- Known honey allergy.

- Psychiatric conditions under provisional diagnosis

Variables

Independent variable was honey mouthwash and Dependent variable was severity of radiation-induced oral mucositis.

Description of Instrument and Tool

Includes three sections as follows: Section A (Socio-demographic data), Section B (Clinical variables) & Section C (WHO Oral Mucositis Grading Scale.

- **Content Validity:** It was **v**alidated by oncologists and nursing experts

- **Reliability**: WHO grading scale was applied consistently by using split-half method (r =0.86)

- **Ethical Consideration:** Approved by Institutional Ethical Committee of PPG Group of Institution and Written informed consent obtained.

- **Pilot Study:** It was conducted at KG Hospital with 10 patients. Results showed that there was a significant reduction in mucositis in experimental group, it was feasible to proceed to main study.

Procedure for Data Collection

- **Preparation:** Explain study, obtain consent, prepare honey solution (20 mL honey + 200 mL water), baseline mucositis assessment.

- **Implementation:** Experimental group used honey mouthwash (3× daily, 6 days); control received routine care.

- **Evaluation:** Post-test mucositis scores assessed using WHO scale.

Techniques of Data Analysis & Interpretation: Descriptive statistics summarized demographic and clinical data, while inferential statistic (paired t-test, independent t-test, and chi-square) assessed differences and associations in mucositis severity between groups.

RESULTS AND DISCUSSION

Table No.4.1: Frequency distribution comparing of pretest and post test score on the level radiation induced oral mucositis among patients in experimental and control group. n = 60

Oral Mucositis Assessment Scale (WHO)	Experimental Group				Control Group			
	Pretest Level		Posttest Level		Pretest Level		Posttest Level	
Grading	f	%	f	%	f	%	f	%
None (0)	0	0.0	6	20.0	0	0.0	0	0.0
Mild (1)	10	33.3	16	53.3	4	13.3	1	3.3
Moderate (2)	13	43.3	8	26.7	10	33.3	7	23.3
Severe (3)	7	23.3	0	0.0	11	36.7	9	30.0
Life threatening (4)	0	0.0	0	0.0	5	16.7	13	43.3

Table 4.2.1 shows that frequency distribution of comparison of pretest and post test score on level of radiation induced oral mucositis among patients in experimental and control group In the experimental group, pre-test scores showed mild (33.3%), moderate (43.3%), and severe mucositis (23.3%), with none free from or having very severe mucositis. Post-test scores demonstrated marked improvement, with 20.0% free from mucositis, 53.3% mild, 26.7% moderate, and none with severe or very severe mucositis.

In the control group, pre-test findings were mild (13.3%), moderate (33.3%), severe (36.7%), and very severe (16.7%), with none free from mucositis. Post-test scores indicated deterioration, with 3.3% mild, 23.3% moderate, 30.0% severe, and 43.3% very severe mucositis, and none free from mucositis.
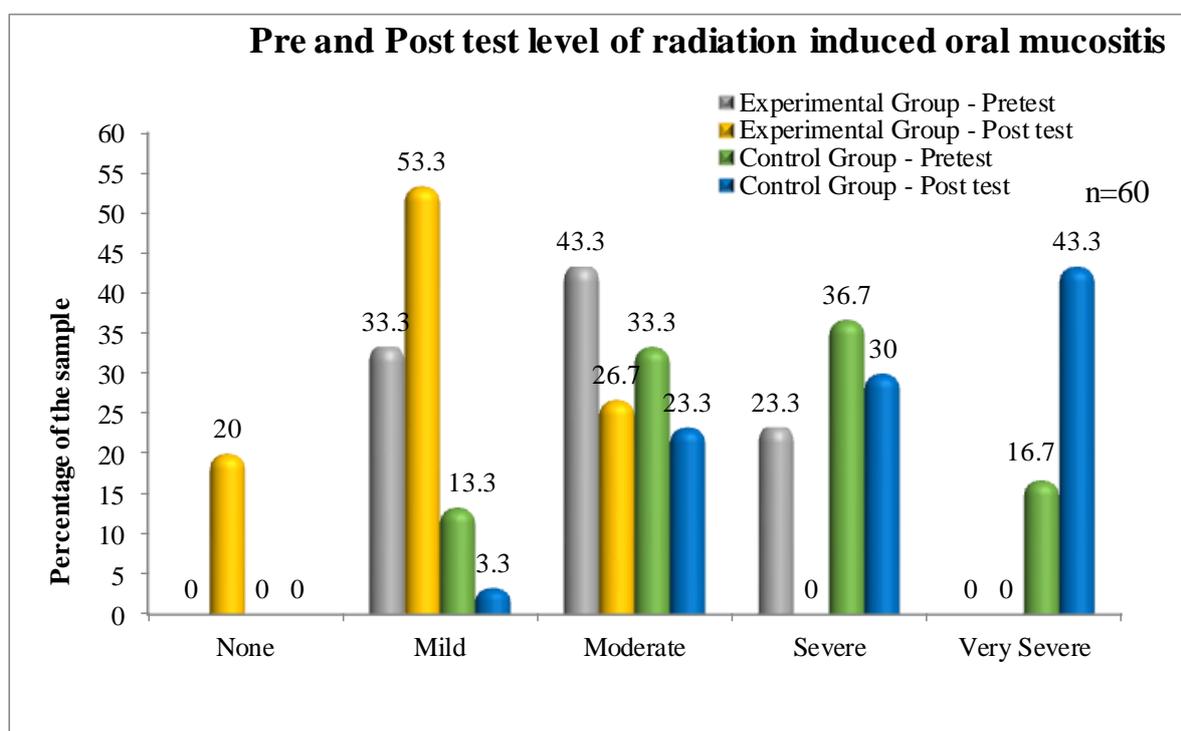

Fig: No.4.1 Comparison between the pretest and posttest levels of radiation- induced oral mucositis among experimental and control group.

Table No.4.3.1: Mean and standard deviation on level of radiation induced oral mucositis in experimental and control group.

Groups	Pre Test				Post Test				Difference in Mean %	Post test	
	Maximum Score	Mean (X)	Mean (%)	SD	Maximum Score	Mean (X)	Mean (%)	SD		df	t test value
Experimental Group	3	1.9	19	0.76	2	1.07	10.67	0.69	8.33	29	8.46*
Control Group	4	2.57	25.67	0.94	4	3.13	31.33	0.9	5.66		

*Significant at $p<0.001$

Major Findings of the Study

- Most patients were aged 51–70 years; males predominated in the experimental group, females in the control group. Nuclear families were more common in the experimental group, and joint families in the control group.

- Hypertension was the common comorbidity in the experimental group, while diabetes predominated in the control group.

- In the experimental group, mucositis improved post-intervention (20% free, 53.3% mild, 26.7% moderate, none severe/very severe). In the control group, severity worsened (43.3% very severe, none free).

- Mean mucositis scores decreased in the experimental group ($1.90 \rightarrow 1.07$; 8.33% reduction) but increased in the control group ($2.57 \rightarrow 3.13$; 5.66% increase).

- Post-test difference was statistically significant ($t = 8.46$, $p \leq 0.001$), confirming honey mouthwash effectively reduced radiation-induced oral mucositis.

- In the experimental group, pre-test mucositis levels showed significant associations with socio-demographic variables (age, education, occupation, income, BMI, family history of cancer, dental visits) and clinical variables (illness duration, site, radiation duration, swallowing, prior treatments, eating/drinking impact, taste changes) ($p \leq 0.05$)

- In the control group, only type of family (socio-demographic) and previous treatments (clinical) were significantly associated ($p \leq 0.05$).

Recommendations for Further Study

- Conduct comparative studies of honey mouthwash vs. chlorhexidine or other standard mouthwashes.

- Undertake true experimental and multicentre studies to validate findings.

- Explore honey mouthwash for other oral problems and compare with non-pharmacological therapies.

- Encourage policymakers and hospital administrators to support integrative oncology practices.

- Promote awareness among oncology teams on simple, cost-effective remedies for managing side effects.

Nursing implication

The present study has implication for nursing practice, nursing education, nursing administration and nursing research.

Nursing Education

Nursing curriculum should integrate evidence-based complementary therapies like honey, with training on WHO Oral Mucositis Grading Scale, simulation practice, and emphasis on holistic care and critical thinking.

Nursing Practice

Honey mouthwash, being natural and affordable, reduces mucositis, enhances healing, and improves comfort. Nurses can include it in oral care, educate patients, and integrate early mucositis assessment into practice.

Nursing Administration

Nursing leaders can adopt honey mouthwash into hospital protocols as a cost-effective intervention, support staff training, and develop SOPs for evidence-based complementary therapies.

Nursing Research

Further research with larger, multi-centre studies is encouraged, including comparative and interdisciplinary research to validate long-term outcomes of honey therapy.

Limitations

Single-centre study with small sample size, variable compliance, uncontrolled confounders, and differences in honey/radiation protocols may limit generalizability.

CONCLUSION

The study demonstrated that honey mouthwash significantly reduced the severity of radiation-induced oral mucositis among head and neck cancer patients. Pre-test mucositis levels showed significant associations with selected demographic variables. As a cost-effective natural agent with antioxidant, anti-inflammatory, antimicrobial, and wound-healing properties, honey improves oral comfort and quality of life during radiotherapy. These findings support honey as an effective adjunct in oncology care. Further large-scale and multicentred studies are recommended to validate and generalize the results.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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