"A STUDY TO DETERMINE THE EFFECTIVENESS OF NORMAL SALINE MOUTH WASH ON PREVENTION OF ORAL MUCOSITIS AMONG PATIENTS RECEIVING CHEMOTHERPHY IN SELECTED HOSPITAL, ERODE DISTRICT"

By

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Dissertation submitted to

THE TAMILNADU DR M.G.R. MEDICAL UNIVERSITY

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In partial fulfillment

of the requirements for the degree of

MASTER OF SCIENCE

IN

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Sri Adichunchanagiri Shikshana Trust

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In partial fulfilment of the requirement for

Degree of Master of Science in Nursing

VIVA VOCE:

1. **INTERNAL EXAMINER : ….……**
2. **EXTERNAL EXAMINER : …….**

ENDORSEMENT BY HEAD OF INSTITUTION

This is to certify that the dissertation entitled **"A study to determine the effectiveness of normal saline mouth wash on prevention of oral mucositis among patients receiving chemotherapy in selected hospital, Erode District"** is a bonafide research work done by **Mr. C. Abe PackiasonM.Sc(N)II year,** under the guidance of **Prof. Mrs. K.KALAIVANI, M.Sc(Nursing)., Principal of** Dr. Mahalingam College of Nursing.

Signature of the Principal

Prof. Mrs. K.Kalaivani, M.Sc (N)

Date :

Place : Sakthi Nagar

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What I am is God's gift to me,

What I become is my gift to God".

- St. Augustine.

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LIST OF ABBREVIATIONS

DMIPSR	**Dharmarathnakara Dr. Mahalingam Institute of Paramedical Science and Research**
et.al	**And others**
F	**Frequency**
fig	**Figure**
H1	**Research hypothesis I**
M.Sc. (N)	**Master of Science (Nursing)**
No.	**Number**
P	**Probability**
Prof	**Professor**
S.D	**Standard deviation**
χ^2	**Chi-square test**
%	**Percentage**
GI	**Gastrointestinal**
HSCT	**Heamatopoietic stem cell transplantation**
5-F4	**5-Fluorourial**
PBCR	**Population based cancer restricts**
WHO	**World Health Organization**
HCG	**Health care global**
ECC	**Erode Cancer Centre**

ABSTRACT

STATEMENT OF THE PROBLEM:

"A STUDY TO DETERMINE THE EFFECTIVENESS OF NORMAL SALINE MOUTH WASH ON PREVENTION OF ORAL MUCOSITIS AMONG PATIENTS RECEIVING CHEMOTHERAPY IN SELECTED HOSPITAL, ERODE DISTRICT"

OBJECTIVES OF THE STUDY:

1. To assess the degree of occurrence of oral mucositis among patients receiving chemotherapy who receive normal saline mouth wash.
2. To assess the degree of occurrence of oral mucositis among patients receiving chemotherapy who do not receive normal saline mouth wash
3. To evaluate the effectiveness of normal saline mouth wash by comparing the occurrence of oral mucositis among the patients of experimental and control group.
4. To find out the association between the occurrence of oral mucositis among patients and their selected demographic variables.

METHODS:

The research approach adopted for this study was quantitative evaluative approach. The research design adopted for this study was Quasi - experimental posttests only control group design. The Non-Probability purposive sampling technique was used in this study.

MAJOR FINDINGS OF THE STUDY:

- In experimental group after giving normal saline mouth wash. On 10th day one subject (3.33%) had developed moderate oral mucositis, and another one subject (3.33%) had developed mild oral mucositis.
- On 10th day, 2 (6.67%) of the samples had developed severe oral mucositis, 27 (90%) of the samples had developed moderate oral mucositis and one subject (3.3%) had developed mild oral mucositis in the control group.
- The mean difference between experimental and control group on 7th day was 1.667, 8 day was 2.1336, 9th day was 2.1 and 10th day was 2.4994.
- Calculated the 't' value on 7th day was 11.80035219 on 8th day t value was 3.78760275, on 9th day t value was 4.526250023, and on 10th day t value was 25.54773056.
- In control group the chi-square value for the occupation $\chi^{2=}$20.750, frequency of brushing χ^2=11.737, stages of cancer $\chi^{2=}$30.646, chemotherapy χ^2=15.124, and duration of illness χ^2=17.716.

  In experimental group the chi square value of the frequency of mouth wash χ^2=19.551, stages of cancer χ^2=23.772, chemotherapy χ^2 =19.362, and duration of illness χ^2 =19.812.

CONCLUSION:

“A perfect stitch makes a perfect body”. The research findings of the present study have proved that the normal saline mouth wash is effective in preventing the client from the occurrence of oral mucositis among those who are receiving chemotherapy. Thus it is getting from the verb that, "prevention is better than cure". the nurse who is taking care of a client can prevent their clients from oral mucositis thus preserves the client self image and gives way to the client to be esteemed one.

CHAPTER-I

INTRODUCTION

“Prevention is better than cure”

WHO is supporting the international union against cancer and pronounced World Cancer Day on 4th February 2010 to promote ways to ease the global burden of cancer. Preventing cancer and raising quality of life for cancer patients are recurring themes.

The theme of this year on world cancer day is “**cancer can be prevented too”. Brown, (2007),** conducted a study on commonly observed oral complications after chemotherapy. He revealed that, oral mucositis is seen within first two weeks of chemotherapy to the head and neck cancer and is related to the dose and duration of treatment. Early signs included dryness progressing to irritative hypermia and oedema with mucosa appearing red and swollen. He concluded that the purpose of oral care in cancer patients is to prevent further damage to oral mucosa and reduce oral complication.

Abnormal growth of cells which have an ability to invade adjacent tissues and even distant organs, which leads to the eventual death of the affected patient, if the turnover has progressed beyond that stage when it can be removed successfully. Cancer can occur at any site (or) tissue of the body and may involve any type of cells.

Maddireddy, (2009), explained that, the term oral mucositis emerged in the late 1980's to describe the adverse effects of chemotherapy induced inflammation of oral mucosa. Symptoms of mucositis may vary from pain and discomfort to an inability to tolerate food (or) fluid. The oral changes start with a reddening inside the mouth was observed at the end of first week of the treatment.

Amber, (2008), stated that, chemotheraphy is the use of one (or) more several drugs to kill cancer cells. The anti cancer drugs work by stopping the division and reproduction of cancer cells.

Marimuthu, (2007) conducted a study on prevention of cancer incidence in five cities-Bangalore, Chennai, Delhi, Bhopal and Bombay in which he noticed that, there was an increase in cancer mortality of about 26.6% than the previously recorded cases in Delhi within a span of 8 years. There was 50% cancer mortality reported in the age group of 55 years and above.

Umamaheswari, (2007), recommended that, prevention measures play a major role in the treatment of side effects due to cancer therapy. Patient should be referred to a dentist for a comprehensive examination to identify and correct any potential complication before cancer therapy is initiated. Most importantly patients are instructed to brush their teeth with soft tooth brush and fluoridated solution after every meal and before bed time. Patients should be

counselled to rinse mouth thoroughly after every meal. So, that food particle do not remain in mouth.

Elliot, (2006), recommended that, patient should brush their teeth 3-4 times a day with a soft tooth brush, patient should rinse their mouth frequently with salt water, baking soda (or) chlorhexidine following chemotherapy, Unless intra oral (or) interstitial treatment is used. Most patients will develop soreness, erythema and moderate tanning of epithelium in the treatment period.

Jessica, (2005), normally the rate at which an organ grow and when it should stop growing is under the control of body itself. The abnormal and uncontrolled division of cells causes cancer which invades and destroy the surrounding tissues. Cancer is often thought of an untreatable, unbearably painful disease with no cure. However, popular views of cancer may be exaggerated and over generalized.

Nurse is a vital person in identifying and educating the patients who are at risk for developing chemotherapy (or) radiation therapy induced mucositis. Prompt identification and initiation of treatment will help the patient to control the mucositis and to improve the prognosis. So nursing care should include the oral hygiene assessment and management with normal saline mouth wash.

NEED FOR THE STUDY

Cancer statistics of India (2009), described that, every year about 85,000 new cancer cases are diagnosed. In that, about 58,000 cancer related death occur every year. India has the highest number of oral and throat cancer in the world with the median age at diagnosis is about 60 years and the average life span is about 58 years in India compared to 75 in developed world.

Oral and gastro intestinal (GI) mucositis can affect upto 100% of patients undergoing high dose chemotherapy and hematopoietic stem cell transplantation (HSCT). 80% of patients with malignancies of the head and neck receiving radiotherapy and a wide range of patients receiving chemotherapy. Alimentary tract mucositis increases mortality and morbidity and contributes to rising health care costs. However, with 5-fluorourail (5-FU) up to 40% get mucositis and 10-15% get oral mucositis with the grade of 3-4.

75-85% of bone marrow transplantation recipients experiences mucositis among which oral mucositis is the most common and most debilitating, especially when melphalan is used. In grade 3 oral mucositis, the patient is unable to eat solid food, and in grade 4 the patients are unable to consume liquids as well. **(Wikipedia)**

Daffler, (2007), explained that, within 5-7 days histologic changes occur, 7-14 days visible inflammation and ulceration and for 21 days there is resolution of mucositis. He recommended four steps to improve prognosis are

regular dental evaluation, patient education for intensive oral hygiene, daily oral assessment, symptomatic treatment and prevention of complications.

Maheswar, (2007) reported that, ulcerative oral mucositis occurs in approximately 40% of patients receiving chemotherapy. In approximately, 50% of these patients, the lesions were severe and required medical intervention including modification of their cytotoxic chemotherapy. The degree and duration of mucositis in patients treated with radiation therapy were related to radiation source, dose, dose intensity, volume of radiated mucosa, smoking, alcohol consumption and oral hygiene.

Hubbard, (2006), identified, several drugs associated with propensity to damage oral mucosa, there include metheotrexate, doxorubicine, 5 fluroruracil, buscilfan, bleomycin and platinum co-ordination complexes. A variety of patient related factors are responsible for increased potential for developing mucositis after chemotherapy and radiation therapy. It is stated that, up to 75% of the general population had chronic periodonatal disease. It is also hypothesized that, many acute bacterial super infectious may follow chemotherapy. Patients with improved oral hygiene can abstains from smoking can definitely reduce the incidence and severity of mucositis.

WHO (2004), cancer is a leading cause of death worldwide which accounted for 7.4 million deaths around 13% of all deaths in 2004. The main types of cancer leading to overall cancer mortality each year are:

- Lung (1.3 million deaths / year)
- Stomach (803000 deaths)
- Colorectal (63900 deaths)
- Liver (610000 deaths)
- Breast (519000 deaths)

More than 70% of all cancer deaths occurred in low-and middle income countries. Deaths from cancer worldwide are projected to continue rising with an estimated 12 million deaths in 2030.

The most frequent types of cancer worldwide (in order the number of global deaths) are,

Among men - Lung, stomach, liver, colorectal, oesophagus and prostate.

- Among women - Breast, lung, stomach, colorectal, and cervical.

Beck, (2004) during the investigator's clinical experience she noticed, patients who have postponed their treatment for the reason of mucositis and immune suppression which otherwise won't occur if they maintains regular oral hygiene practice and good nutrition. So, the researcher intended to do a study on effectiveness of normal saline gargle and oral hygiene practice in preventing mucositis.

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4. To find out the association between the occurrence of oral mucositis among patients and their selected demographic variables.

HYPOTHESIS

The following hypotheses are formulated for the study.

H_1 - There will be significant reduction in the occurrence of oral mucositis for those receiving normal saline mouth wash.

- ❖ Patient receiving chemotherapy will develop mucositis from 4-5 days of treatment.
- ❖ Normal saline mouth wash will have a therapeutic effect in preventing chemotherapy induced oral mucositis.

OPERATIONAL DEFINITION

- **Chemotherapy** - refers to the use of cytotoxic drugs to treat patients diagnosed with cancer.
- **Oral mucositis** - refers to the soreness and erythema of oral mucosa occurring as a side effect of chemotherapy which can be assessed using WHO mucositis assessment scale and patient judged mucositis grading scale developed by

  (DENISE.J.MAHOOD)

- **Normal saline mouth wash** – rinsing the oral cavity with 0.9% sodium chloride solution at room temperature.
- **Effectiveness** - Reduction in the occurrence of oral mucositis as assessed by using WHO scale for assessing oral mucositis and patient judged oral mucositis grading scale after the administration of saline mouth wash.
- **Prevention** - The management of those factors that could lead to oral mucositis so as to prevent the occurrence of the oral mucositis.

LIMITATIONS

- ❖ The study is limited to those who are receiving chemotherapy.
- ❖ The study is limited to 2 weeks period only.
- ❖ To those who are willing to participate.
- ❖ Limited to only those patients who are receiving chemotherapy during the data collection period.

CONCEPTUAL FRAME WORK

Roy's Adaptation Model -1999 (Modified)

Conceptualization is the process of forming ideas designs and plan .A conceptual frame works deals with the concepts assembled together by their relevance to research problems, which provides a certain framework of reference for clinical practice, research and education.

- Polit and Hungler, 1999

The conceptual framework used in this study was based on Sister Calista Roy's Adaptation models (1999), which views the individual as an adaptive system, who functions as a whole, through the interdependent of subjects.

Input:

Input consists of stimuli which can come from the environment (or) within a person. In this study stimulus from the external environmental are occupation, frequency of mouth wash, brushing, personal habits chemotherapy drugs, chemotherapy, types of cancer and the internal factors which contributes within the patients are age, sex, stages of cancer and duration of illness.

Throughput:

Throughput makes person processors and effectors, processors refer control mechanism that a person uses an adaptive system.

Physiologic needs:

In involves body basic needs. Here the physiologic need of the client is to prevent the oral mucosal damage which encounters oral mucositis and to maintain normal mucosal integrity.

Self concept:

It refers to the perception of oneself in maintaining a good body image. Here it refers to the clients belief in prevention of oral mucositis on his own.

Interdependent:

Interdependent refers to interact with health team members to seek information about care of oral mucosa.

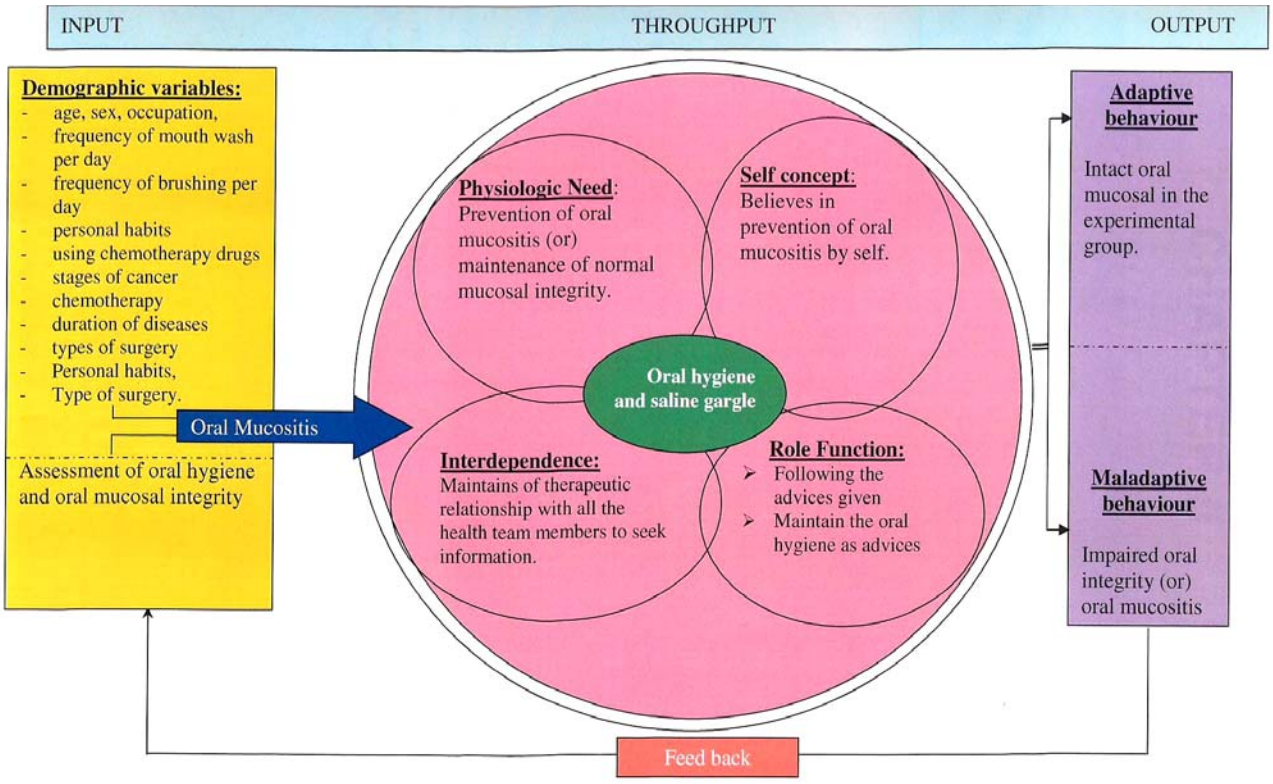
Role function:

In this the role function of the clients is to follow the advices given by the health team members and maintaining oral hygiene as adviced by the health team members.

Output:

In this, the experimental groups who received oral saline mouth wash by following the advices given shown an adaptive behaviours by means of healthy and intact oral mucosa. Whereas, in control group who have not been received oral saline mouth wash exhibited a maladaptive behavioural by means of impaired oral integrity.

Fig.1: Conceptual frame work based on Roy's adaptation model – 1999 (Modified)



CHAPTER II

REVIEW OF LITERATURE

The term "review of literature" refers to the activities involved in identifying and searching for information on a topic and developing a comprehensive picture of the state of knowledge on that topic.

- Polit and Hungler, 2008

Thus the review of literature is an essential step in the development of a research project. It helps the researcher to design the proposed study in a scientific manner to achieve the desired result. It helps to determine the gaps, consistencies and inconsistencies in the available literature about a particular subject under the study.

The collected literature have been divided into the following sections,

Section A: Literature related to cancer and its treatment.

Section B: Literature related to the side effects of cancer therapy and management.

Section C: Literature related to oral complications and management with saline gargle.

Section A: CANCER AND ITS TREATMENT

Cancer Society of India, (2009) identified, cancer as the second

leading cause of death worldwide and was expected to increase by 50% in the coming 25 years. Two third of new cases are detected in the advanced staged when the treatment is ineffective. Such patients continue to block and exhaust the resources which otherwise could effectively be utilized for the treatment of patient in early stage.

National Cancer Institute, (2008) described that, a cancer incidence rate is the number of new cancers of a specific site occurring in a specified population during a year usually expressed as number of cancers per 1,00,000 population. Cancer incidence rate in India is 85,000 per year.

Tumey, (2007) described that, among females, the most common site for cancers were breast and cervical cancer. In older population based cancer registries, Barshi and Chennai, PBCR had always recorded highest incidence of cervical cancer. The highest age specific incidence rate of 98.2 per 100,000 for cancer was seen in 60-64 years age group, which for breast cancer (87.4) was seen in 45-55 age groups. Based on data of PBCR the estimated number of new cancers during 2008 in India was 90,708.

Robert, (2007), conducted a study on lung cancer due to smoking which revealed the incidence that lung cancer accounts for more than 50 % of all male death from cancer in western countries. Where, it is widely prevalent of all deaths from lung cancer, small cell carcinoma accounts for 25%, sequemous for 50%, large cell 10% and adenocarcenoma 10%. A tumor arising

from a peripheral bronchus may attain **a** very large size without producing significant degree of collapse. In small cell type cancer, radiation can be used only over some parts of the body, where cancer has spread and is for treating the symptoms not for cure.

American Cancer Society, (2006), Cancer is a feared and dreaded disease for several reasons. It may be present in an advanced stage with no symptoms, compliance with vigorous treatment and sometimes disfiguring. Treatment does not guarantee a cure.

Galen, (2006), described the cancer as crab like nature. Cancer may be regarded as a group of diseases characterized by an abnormal growth of cells. Which has an ability to invade adjacent tissues and distant organs ends with an eventual death, if the tumor has progressed beyond that stage, when it cannot be successfully removed.

Mc Cathy, (2006) described that, presently more than 50% oral cancer are detected only after they have reached an advanced stage such cancer are disfiguring and painful. The treatment required is both extensive and expensive and survival rates are low with 5 years. Surgery and radiotherapy can cure only the early cancer.

Chalette et.al., (2005), performed a study to evaluate the efficiency of doxorubicin based combination chemotherapy for adult patients with

metastatic soft tissue sarcoma. This study stated that, survival rate tumour shrinkage is better combination chemotherapy regimens than the single agent doxorubicin chemotherapy.

Hassey, (2005) stated that, chemotherapy has been widely used for the palliative management of cancer symptoms. Local control and survival rate is also high and aiming for caring the illness. The established methods of treating cancers are chemotherapy, radiation therapy, surgery, and hormonal treatment. In some cases, multiple techniques are used in sequence to treat cancer.

Siegel, (2005) conducted a study about the role of adjuvant chemotherapy in metastasis of breast cancer and found that; the patients were achieved months (or) years of symptom free survival.

Farniok and Levitt, (2004), showed that, the important role played by chemotherapy in the treatment of patients with colorectal cancer. Ceratin randomized trials showed that, patients with colon cancer treated with surgery and radiation had better control rates (93% and 72%) compared to patients treated with surgery alone. In addition, patients with tumor have improved local control when they received post operative chemotherapy.

Pollack et.al. (2004), conducted a study among 835 patients to find the relationship of increasing chemotherapy drug dose to reduce distant metastases and mortality in men with prostate cancer. With a median follow up of 64

months, there were significant reduction in rates of chemical failure distant metastasis and overall mortality in patients with prostate cancer and this study showed the effectiveness of ugh dose chemotherapy in controlling distant metastasis.

Section B: THE SIDE EFFECTS OF CANCER THERAPY AND MANAGEMENT:

Paul, (2008) conducted an awareness programme for reducing chemotherapy induced mucositis in Kerala. The programme provided scientific information of self care, exercise and nurses support to promote prevention of mucositis. The effectiveness of this programme was tested on a large scale randomized control trial. The result had shown a reduction in incidence of oral mucositis from 46% to 26%.

Algemir et.al., (2007) analyzed the side effect of 938 cancer patient's prior to the treatment and found that patients anticipated an average of 7 symptoms and the most common expected side effects were fatigue, nausea, mucositis, abdominal pain, dry mouth, hair loss and skin problem.

Clare, (2007), performed a study to investigate the side effects experienced by patients with colorectal cancer receiving 5-flurouracil chemotherapy. This study revealed that, oral mucositis as the worst side effect experienced by the patients and also change in taste and weight loss.

Dodd, (2007), In California, conducted a study among 48 cancer patients with varying diagnosis who were receiving chemotherapy to assess the self care behaviors for the side effects of chemotherapy. The common side effects were nausea, vomiting, mouth blisters, alopecia, constipation, the self care behaviors for nausea and vomiting was taking prescribed medicine, for mouth blisters avoiding certain type of food items and use of topical solutions, for constipation increase roughage in diet; wearing a wig (or) hat were most frequently reported behaviors for hair loss.

Evan, (2007) stated that, teaching the patients about adequate oral intake before and after during cisplatin-therapy and maintaining accurate intake and output record during therapy can prevent the renal cell damage due to cisplatin administration. She suggested that, a proper evaluation of electrolyte level and renal functioning also could aid in preventing the complication.

Emerton, and Philip, (2007), conducted a study on quality of life and oral functions in patients treated with radiation therapy and chemotherapy to assess the quality of life. Oral function and oral symptoms in cohorts of patient during and after radiation therapy and chemotherapy which concluded that, oral complication during and after radiation therapy and chemotherapy were common and affect the quality of life.

Quargnenti, (2007) performed a study by using a risk assessment tool for evaluating the side effects among 30 patients after their first cycle of chemotherapy. The most common side effects reported by the patients were anaemia (45%), oral mucosal problems (30%), nausea and vomiting (20%) and constipation (15%).

Rubenstein, (2007) conducted a study among 35 patients ranked three most burdensome side effects that interfered with homework school and social relationship. The patients rated burdensome side effect are 17(49%) reported mucositis, 15(43%) reported diarrhoea and 3(10%) reported constipation.

Judith, (2006) conducted, "a study on the effect of mucositis on quality of life in patients with head and neck cancer". In that large retrospective review of stage III and IV head and neck cancer patients who have been undergoing chemotherapy and reditation therapy among were 83% developed oral mucositis.

Winterberg, (2006) conducted a descriptive study among 19 cancer patients receiving chemotherapy with cyclophosphamide, doxorubicin, vincristine, predrisolone and to assess problem experience by the patient's and found that all the patients experienced alopecia and mucositis (79%) the other problems were fatigue (72%) taste changes (77%) and constipation (60%).

Section C: ORAL COMPLICATIONS AND MANAGEMENT WITH SALINE GARGLE:

World health organization (2009), developed an oral toxicity scale for the measurement of oral mucositis which include 5 grades beginning from 0 to 4 the grade o is none category, grade 1 is soreness and discomfort, grade 2 is erythematic ulcer, grade 3 is extensive ulcer and grade 4 is alimentation not possible.

Epstein, (2008) stated that, nasopharyngeal mucositis is a common and treatment limiting side effect of cancer therapy. Severe oral mucositis can lead to the need to interrupt (or) discontinue cancer therapy and this may also increase the risk of local and systemic infection and significantly affect the quality of life and cost of care.

Madankumar (2008), done a comparative study to assess the effectiveness of saline soda and providone iodine on 76 patients. Results showed, there is no difference in efficiency between the two solutions. The study demonstrated the use of alcohol free solution could reduce the severity and delay the onset of oral mucositis due to anti neoplasitc radiotherapy. Thus improving the quality of life for patients, the use of alcohol free solutions could be advocated for the patients.

Silverman, (2008) explained that, patients have mucositis, there were three to ten days following chemotherapy patients may experience a burning sensation followed by ulcers. When ulceration develops, treatment is mostly supportive until the cells regenerate themselves, which takes about 7-14 days.

Marylin, (2008) stated that, mucositis is a general term referring to an inflammatory reaction and ulcerative lesions of the mouth and oropharynx that occur secondary to radiation therapy and certain chemotherapy agents. The tissue destruction and functional alteration in the oral cavity become an inevitable problem when the patients with cancer receive the treatment especially radiation therapy. Mucosal lining of the oral cavity, oropharynx and oesophagus are sensitive to radiation therapy.

Brown, (2007), conducted a study on commonly observed oral complications after chemotherapy. He revealed that, oral mucositis is seen within first two weeks of radiation therapy to the head and neck cancer and is related to the dose and duration of treatment. Early signs included dryness progressing to irritative hypermia and oedema with mucosa appearing red and swollen. He concluded that the purpose of oral care in cancer patients is to prevent further damage to oral mucosa and reduce oral complication.

Sonis, (2007), Oncology nurses have developed scoring systems for assessment of oral mucositis and for patient management. Oral mucosa rating scale had examination rating scale to quantify the type and severity of

clinically evident oral mucosal changes like atrophy, erythema, ulceration and pseudomembranous hyperkeratotic lichenoid and oedematous changes with a scale ranging from 0 to 3.

Johnson, (2006) suggested that, pre-treatment eradication of infection and maintenance of good oral hygiene have been the main stay of therapeutic options for patient's with radiation therapy and chemotherapy induced mucositis . A healthy oral and gastrointestinal mucosa is of significant value of emotional expression, verbal communication, comfort, nutrition, elimination and fluid and electrolyte imbalance.

Ching, (2006) conducted a prospective comparative study to determine the effect of oral care protocol intervention in prevention of chemotherapy induced oral mucositis in cancer patients 21 children who were included in the first four month period of study were constituted as control group and another 21 children who were enrolled in subsequent four months were assigned to the experimental group, which they were given an oral protocol intervention. The oral care protocol consisted to tooth brushing, 0.2% chlorhexidne mouth rinses and 0.9% saline rinses. Children in both groups were evaluated twice a week for three weeks. The results were severity of oral mucositis and related pain were significantly reduced with intervention in the ratio of 3:2.

CHAPTER III

METHODOLOGY

Research methodology is the systematic way of doing research to solve a problem. It comprises of the statement of the problem, the objectives of the study, the hypothesis that have been formulated, the variables under study, the methods used for data collection and the statistical methods used for analyzing the data and the logic behind it. **(Kothari, 2003).**

On the whole it gives a general pattern of gathering and processing the Research data.

This chapter deals with the research approach, research design, setting, population, sample, sampling technique, criteria for sample selection, development and description of the tool, validity, reliability, pilot study and the data collection procedures.

RESEARCH APPROACH:

It is an applied form of research that involves finding out how well a program, practice, procedure (or) policies are working.

(Polit, 2004)

The choice of research approach constitutes one of the major decision, which must be made in conducting research study.

The research approach adopted for the study was quantitative (Evaluative) approach.

RESEARCH DESIGN:

Polit (2004) stated that, researcher's overall plan for obtaining answers to the research questions or for testing the research hypothesis referred to the research design.

The research design adopted for the study was Quasi Experimental – Post test only control group design.

Group	Sampling technique	Pre test	Treatment	Post test
Experimental group		-	Normal saline mouth wash is given	O_1- Observed the degree of mucositis by WHO oral mucositis assessment scale.
Control group		-		O_1- Observed the degree of mucositis by WHO oral mucositis assessment scale.

Experimental group	-	X_1	O_1
Control group	-	-	O_1

X_1 - Intervention

O_1- Post test.

VARIABLES UNDER STUDY:

Treece and Treece (1988) stated that, a variables is anything that can change (or) anything that is liable to vary.

Independent Variable:

Treece and Treece (1988) Stated that, independent variables is the variables that stands alone and is not dependent on any other. It is the cause of the action.

In this study, the independent variable is normal saline mouth wash administrated to those who are receiving chemotherapy.

Dependent variables:

Treece and Treece (1988), stated that, the dependent variables is the effect of the action of the independent variable and cannot exist by it.

In this, study dependent variables is the lever of mucositis of cancer patients those who are receiving chemotherapy.

Extraneous variables:

Age, sex, occupation, chemotherapy drugs, stage of cancer, personal habits, types of cancer.

POPULATION:

Polit and Hungler (2004) stated that, population is an entire aggregation of cases that a designed set criteria.

The population for this study is all the cancer patients those who are

receiving chemotherapy.

SAMPLE:

Polit and Hungler (2004), Stated that, a sample consists of a subset of the units that compose the population.

The samples for this study included all cancer patients those who are receiving chemotherapy at Erode Cancer Centre Hospital, Thindal, Erode District, who fulfills the inclusion criteria.

SAMPLE SIZE:

Total sample is 60.

- **Experimental group:**

30 samples have been grouped as experimental group who received normal mouth wash.

- **Control group:**

30 samples have been grouped as control group, who have not received normal saline mouth wash.

SAMPLING TECHNIQUE:

Polit and Hungler (2004) stated that, sampling is the process of selecting a portion of population to obtain data regarding a problem.

In this study non-probability sampling technique was used to select the

sample by using purposive samples (or) sampling method.

SITE OF THE STUDY:

The site of this study was Erode Cancer Center, Thindal, Erode District.

SETTING OF THE STUDY:

The setting of this study was General ward at Erode Cancer Center, Thindal, Erode District.

CRITERIA FOR SELECTION OF SAMPLE:

Inclusion criteria:

- Patients without oral cancer
- Patients who are willing to participate in this study.
- Patients who are able to follow instruction.

Exclusion criteria:

- Patients who have already have extensive severe mucositis.
- Patients who are receiving chemotherapy for more than 4 days.
- Patients with the habits of tobacco chewing.

SELECTION AND DEVELOPMENT OF INSTRUMENT:

Polit and Hungler (2004) stated that, the data collection tools are the procedure (or) instruments used by the researcher to observe (or) measure the key variables in the research problem.

Selection for Instrument:

The investigator utilized "standardized modified WHO oral mucositis Assessment scale".

Development of the tool:

The following steps have been carried to develop the research tool,

1. Related literatures have been reviewed.
2. Blue print was prepared.
3. Consultations of the subject experts were taken and alteration was made accordingly.
4. Consultation with statistician was done for the preparation of the plan for statistical data analysis.
5. The literatures include journals, articles, books, published and research studies were reviewed and used for the development of tool.

DESCRIPTION OF THE DATA COLLECTION INSTRUMENT:

The instrument used for data collection was "standardized modified WHO oral mucositis assessment scale".

PART I: Demographic variables:

The selected demographic variables of the study are life age, sex, occupation, chemotherapy drugs, and frequency of mouthwash, brushing, duration of illness, chemotherapy, stages of cancer, personal habits, and types of cancer.

PART II: WHO, oral mucositis assessment scale:

WHO, oral mucositis assessment scale to assess the grade o£ mucositis in patients receiving chemotherapy after thoroughly inspecting their oral cavity on the 10th day of this chemotherapy cycle.

Grade 0	Grade 1	Grade 2	Grade 3	Grade 4
None	Soreness + Erythema	Erythema, Ulcer, can eat solid food	Ulcers with extensive erythema, liquid diet only	No possible alimentation.

For analysis the score 0-4 was given to no mucositis, mild, moderate and severe mucositis possible respectively.

Grading criteria:

Grade	WHO oral mucositis assessment scale	Inference
Grade - 0	None	Mild mucositis
Grade - 1	Soreness + Erythema	
Grade - 2	Erythema, Ulcer, can eat solid food	Moderate mucositis
Grade - 3	Ulcers with extensive erythema, liquid diet only	
Grade-4	No possible alimentation	Severe

0 - 1 Mild, 2-3 Moderate, 4 - Severe

VALIDITY AND RELIABILITY:

Validity:

Polit and Hungler, (2004) stated that, content validity refers to the

degree to which an instrument measures what it is suppose to measure.

To establish content validity. Tool was given to 5 experts in the field of the nursing, (medical surgical nursing) and oncology (oncologist).

According to the experts opinion some change have been made in demographic data and the tool was finalized.

Reliability of the tool:

Reliability is defined as the extent to which the instrument yields the same results on expected measure; it is concerned with consistency, accuracy, stability and homogeneity.

In this study "standardized WHO oral mucositis assessment scale" was used to measure the mucositis level of patients.

PILOT STUDY:

The purpose of conducting the pilot study was to find out the feasibility and practicability of the study. 6 patients were selected in the HCG and the pilot study was conducted for 2 weeks.

The investigator had obtained written permission from the administrator of HCG Hospital prior to the pilot study. The purpose of the study was explained to each subject and an informed consent was obtained prior to the study, confidentiality was assured to all subjects.

Assignment of the samples (3 each) was done to experimental and control group. Experimental group received normal saline mouth wash from

the investigator. Both groups had regular care from the health professionals such as doctors and nurses. A concise data analysis was done by using descriptive and inferential statistics.

The tools were found to be feasible, practicable, and acceptable and there was no necessity to make any further changes after the pilot study.

DATA COLLECTION PROCEDURE:

1. Formal administrative permission was obtained to conduct the study. It was obtained from the chief medical officer, General ward in charge of Erode Cancer Center, Erode.
2. The investigator had contact with all the subjects in the study individually, and the nature of the help, cooperation required and the purpose of the study were explained to them.
3. Confidentiality was assured to all subjects and obtained informed consent from the subjects indicating the willingness to participate in the study. Samples were selected as per the sampling criteria and divided into two groups.
4. The investigator ensured that, the data collection process would not affect the routine of the ward.

5. Experimental group received normal saline mouth wash from the investigator while control group do not receive it, but both groups had

the support and care from the health professionals as per routine.

6. The degree of the oral mucositis was assessed with the WHO oral mucositis assessment scale in each phase, (0, 1, 2, 3, 4) among experimental and control group of chemotherapy receiving clients.
7. Data collection was terminated after thanking each of the subjects.

PLAN FOR DATA ANALYSIS:

Polit and Hungler (2004), stated that, the data analysis is the systematic organization and synthesis of research data and the testing of research hypothesis using those data.

The analysis plan is based on the objectives of the study using descriptive and inferential statistics after organizing the data in master coding sheet.

Plan for data analysis:

S. No.	Data Analysis	Method	Remarks
1.	Descriptive statistics	Mean, standard deviation, mean percentage.	Assess the degree of mucositis in experimental and control group.
2.	Inferential statistics	Unpaired ‘t’ test	Compare the mucositis level by experimental and control group.
		Chi-Square test	Association between oral mucositis and selected demographic variables of experimental and control group.

ETHICAL CLEARANCE:

- The study was conducted after the approval from the Head of the Institute, Dharmaratnakara Dr. Mahalingam Institute of Paramedical Science and Research.
- Permission was obtained from the chief medical officer of Erode Cancer Center Hospital, Thindal, Erode District.
- The study was conducted after getting consent from the study participants

SCHEMAIC REPRESENTATION OF THE STUDY DESIGN

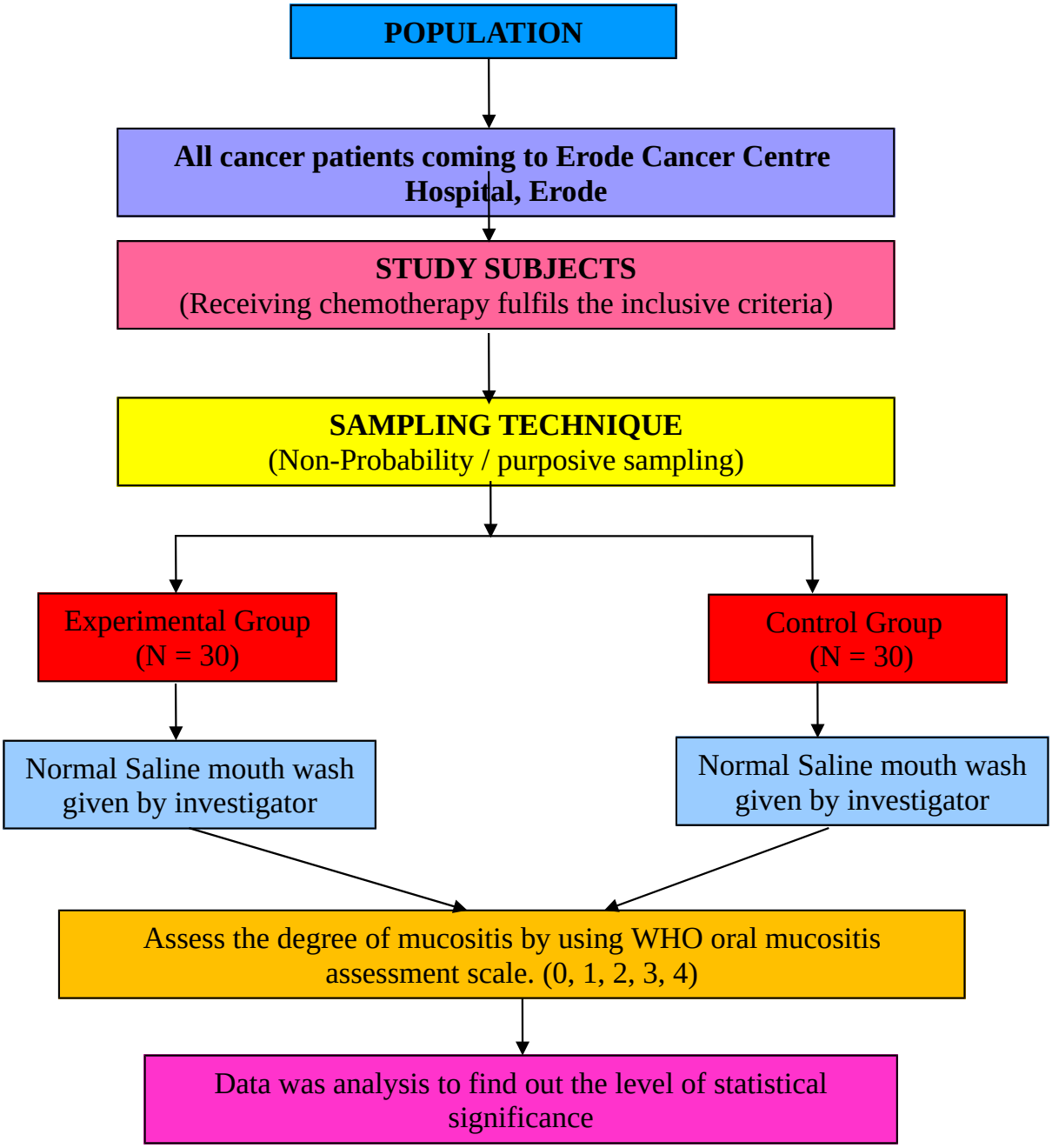


Fig. 2 : Schematic representation of the study design

CHAPTER-IV

ANALYSIS AND INTERPRETATION

Young and Marie (1996) stated that, the goal of analysis is to summarize the data, so that it might provide answers to the research question. Analysis of the data involves the translation of information collected during the course of research project into interpretable, convenient and descriptive terms to draw inferences known by using statistical method.

STATISTICAL ANALYSIS:

This chapter deals with the analysis and interpretation of the data obtained from 60 patients admitted to Erode Cancer Center, Thindal at Erode District using WHO, oral mucositis assessment scale. The data was processed and analyzed based on the objectives formulated for the study.

OBJECTIVES OF THE STUDY:

1. To assess the degree of occurrence of oral mucositis among patients receiving chemotherapy who receive normal saline mouth wash.
2. To assess the degree of occurrence of oral mucositis among patients receiving chemotherapy who do not receive normal saline mouth wash.
3. To evaluate the effectiveness of normal saline mouth wash by comparing the occurrence of oral mucositis among the patients of experimental group and control group.

4. To findout the association between the occurrence of oral mucositis among patients and their selected demographic variables.

DESCRIPTION OF DATA ANALYSIS:

The data obtained was analyzed using descriptive and inferential statistics and presented under the following headings:

Section- 1: Description of study subjects by socio - demographic characteristics.

Section - II: a. Day - by - day scores of oral mucositis of control group.

b. Day - by - day scores of oral mucositis of experimental group.

c. Grading of oral mucositis on the 10 day among control group.

d. Grading of oral mucositis on the 10 day among experimental group

Section - III: Day - by - day comparison of grading of oral mucositis between control group and experimental group.

Section - IV: a) Association between grading of oral mucositis on 10 day of control group and demographic variables.

b) Association between grading of oral mucositis on 10 day of experimental group and demographic variables.

SECTION - I

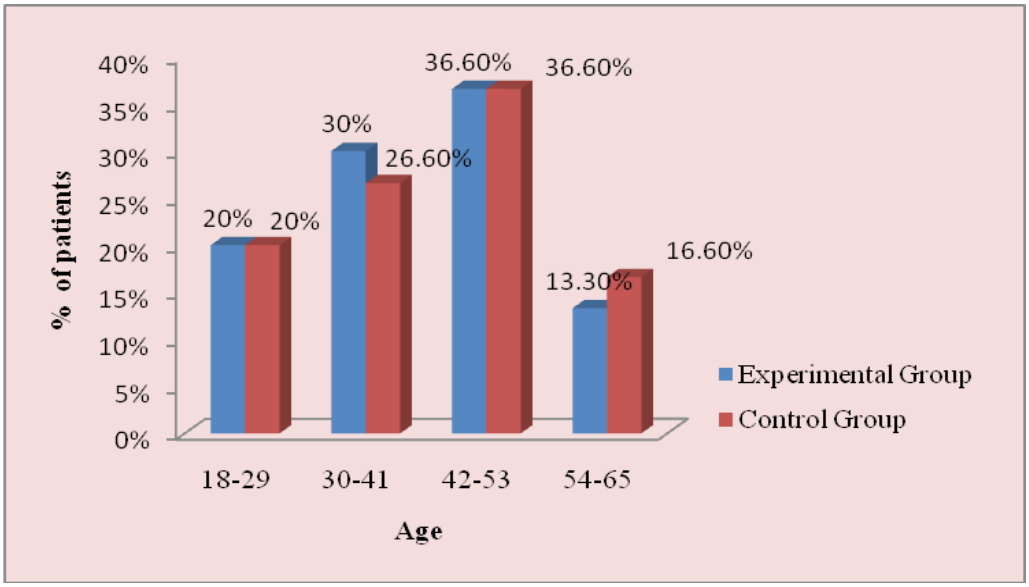
Table 1: Description of study subjects by socio-demographic characteristics

N = 60

S. No.	Demographic Variables	Group			
		Experimental Group		Control Group	
		F	%	F	%
1	**Age (in years)**				
	a) 18-29	6	20%	6	20%
	b) 30-41	9	30%	8	26.6%
	c) 42-53	11	36.6%	11	36.6%
	d) 54-65	4	13.3%	5	16.6%
2	**Sex**				
	a) Male	11	36.6%	9	30%
	b) Female	19	63.3%	21	70%
3	**Occupation**				
	a) Cooly	17	56.66%	18	60%
	b) Business man	3	10%	3	10%
	c) Private employee	5	16.6%	5	16.6%
	d) Govt. employee	5	16.6%	4	13.3%
4	**Frequency of mouth wash**				
	a) Once a day	2	6.66%	7	23.3%
	b) Twice a day	4	13.3%	9	30%
	c) Every time after eating	24	80%	14	46.6%
	d) Any specific	-	-	-	-
5	**Frequency of Brushing**				
	a) Once a day	9	30%	24	80%
	b) Twice a day	17	56.66%	6	20%
	c) Every time after eating	4	13.3%	-	-
	d) Any specific	-	-	-	-
S. No.	**Demographic Variables**	**Group**			
		Experimental Group		**Control Group**	
		F	**%**	**F**	**%**
6	**Personal habits**				
	a) Smoking	7	23.3%	6	20%
	b) Alcoholism	4	13.3%	1	3.33%
	c) Betal chewing	19	63.3%	23	76.6%
7	**Chemotherapy drugs**				
	a) Cisplatin	8	26.66%	13	43.3%
	b) Cyclophosphamide	7	23.3%	5	16.6%
	c) Docetaxel	6	20%	4	13.3%
	d) Vinblastine sulphate	9	30%	8	26.6%

8	**Stages of cancer**				
	a) I	7	23.3%	2	6.6%
	b) II	20	66.66%	9	30%
	c) III	3	10%	19	63.3%
	d) IV	0	0%	0	0%
9	**Received chemotherapy**				
	a) 1-5 times	11	36.66%	4	13.3%
	b) 5-10 times	17	56.66%	5	16.6%
	c) 10-15 times	2	6.66%	12	40%
	d) Above – 15 times	0	0%	9	30%
10	**What is the duration of illness?**				
	a) Less than 1 yr	7	23.3%	2	6.6%
	b) 1-4 yrs	21	70%	13	43.3%
	c) 4-8 yrs	2	6.66%	11	36.6%
	d) Above 8 yrs	0	0%	4	13.3%
11	**Types of cancer**				
	a) Thyroid cancer	10	33.33%	9	30%
	b) Breast cancer	7	23.3%	5	16.6%
	c) Cancer of cervix	9	30%	14	46.6%
	d) Lung cancer	4	13.33%	2	6.6%

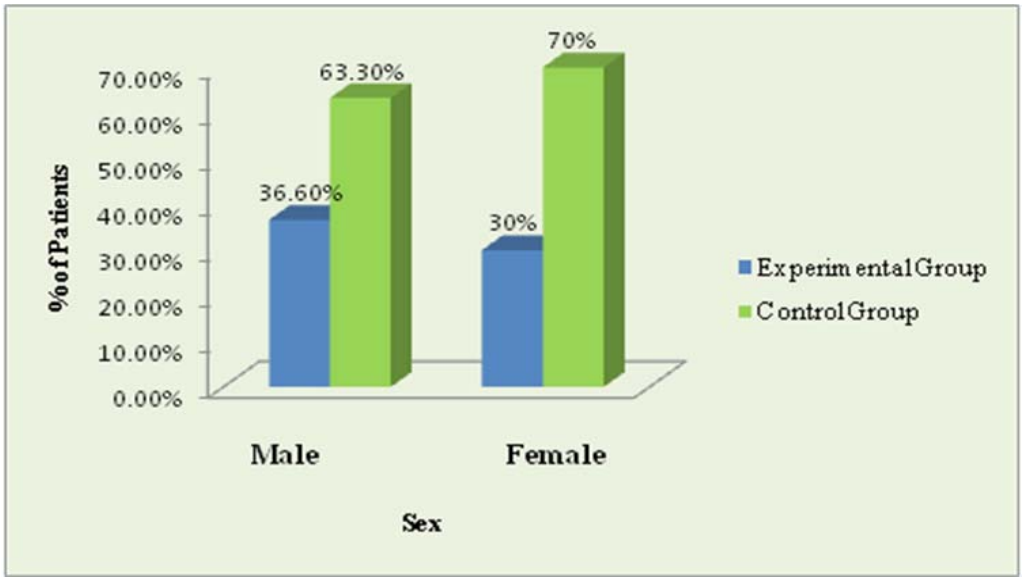
Fig. 3: Bar diagram showing the distribution of sample by age in years



The above diagram shows that in experimental group 20% of patients are 18-29 years old, 30% of patients are 30-41 years old, 36.60% of patients are

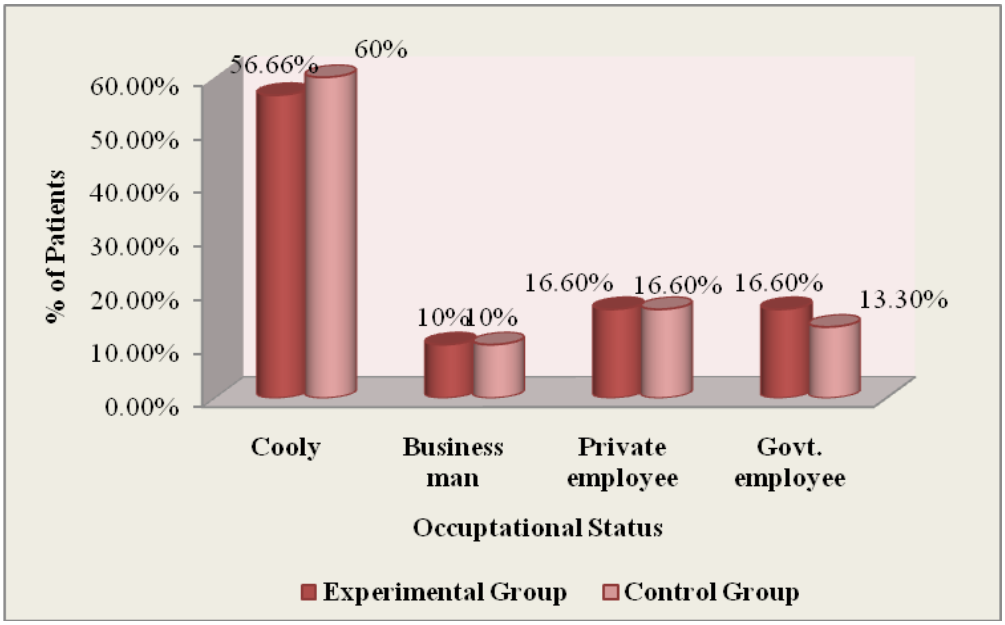
42-53 years old and 13.30% of patients are 54-65 years old. In control group 20% of patients are 18-29 years old, 26.60% of patients are 30-41 years old, 36.60% of patients are 42-53 years old and 16.60% of patients are 54-65 years old.

Fig. 4: Bar diagram showing the distribution of sample by sex



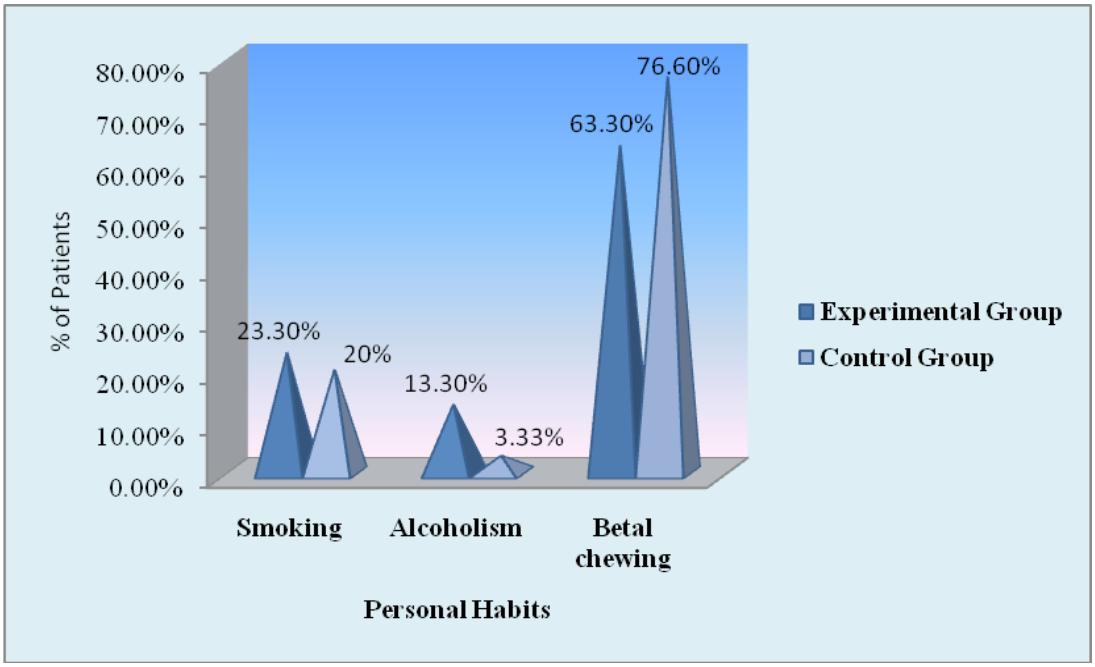
The above diagram shows that, in experimental group 36.60% of patients are male and 63.30% of patients are female. In control group 30% of patients are male and 70% of patients are female.

Fig. 5: Cylindrical diagram showing the distribution of sample by current occupational status



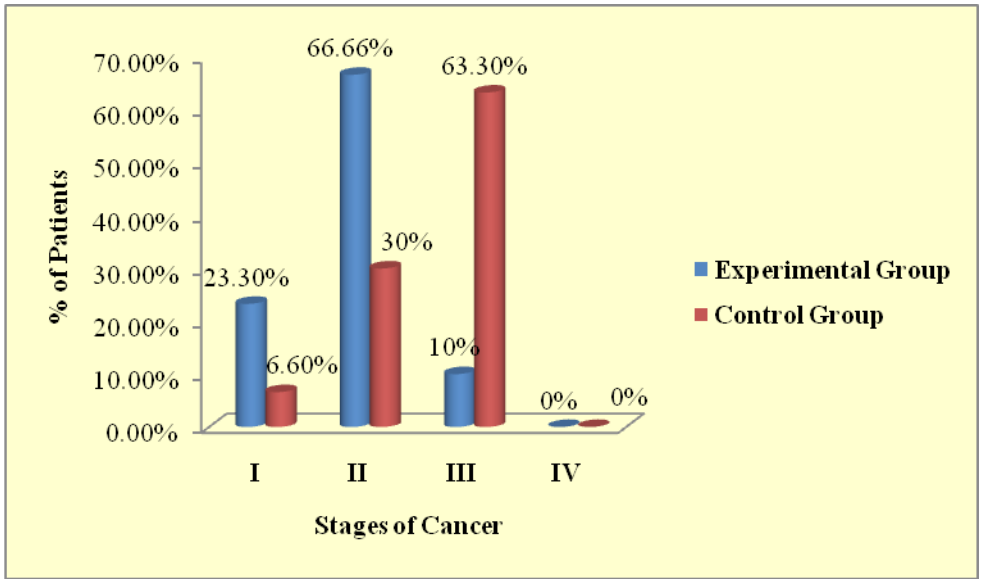
The above diagram shows that, in experimental group 56.66% of patients are doing coolly job, 10% of patients are doing business, 16.60% of patients are private employee and 16.60% of patients are Govt. employee. In control group 60% of patients are doing coolly job, 10% of patients are doing business, 16.60% patients are private employee and 13.30% of patients are Govt. Employee.

Fig. 6: Pyramidal diagram showing the distribution of sample according their personal habits.



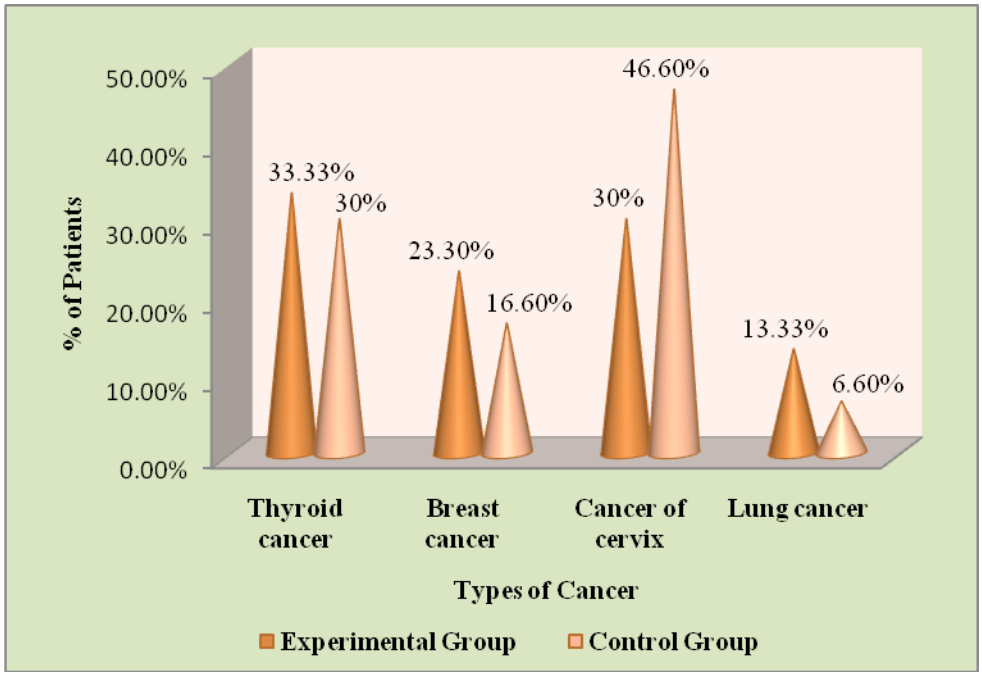
The above diagram shows that, in experimental group 23.30% of patients have the habit of smoking, 13.30% of patients have the habit of drinking alcoholism, 63.30% of patients have the habits of betal chewing. Whereas, in control group 20% of patients have the habit of smoking, 3.33% of patients have the habit of drinking alcoholism and 76.60% of patients have the habit of betal chewing.

Fig. 7: Cylindrical diagram showing the distribution of sample by stages of cancer



The above diagram shows that, in experimental group 23.30% of patients are in I stage, 66.66% of patients are in II stage and 10% of patients are in III stage. Whereas, in control group 6.60% of patients are in I stage, 30% of patients are in II stage, 10% of patients are in III stage and 0% of patients are in III stage of cancer.

Fig. 8: Conical diagram showing the distribution of sample by types of cancer



The above diagram shows that, in experimental group 33.33% of patients have thyroid cancer, 23.30% of patients have Breast cancer, 30% of patients have cancer of cervix and 13.33% of patients have lung cancer. Whereas, in control groups 30% of patients have thyroid cancer, 16.60% of patients have cancer of cervix and 6.60% of patients have lung cancer.

SECTION – II

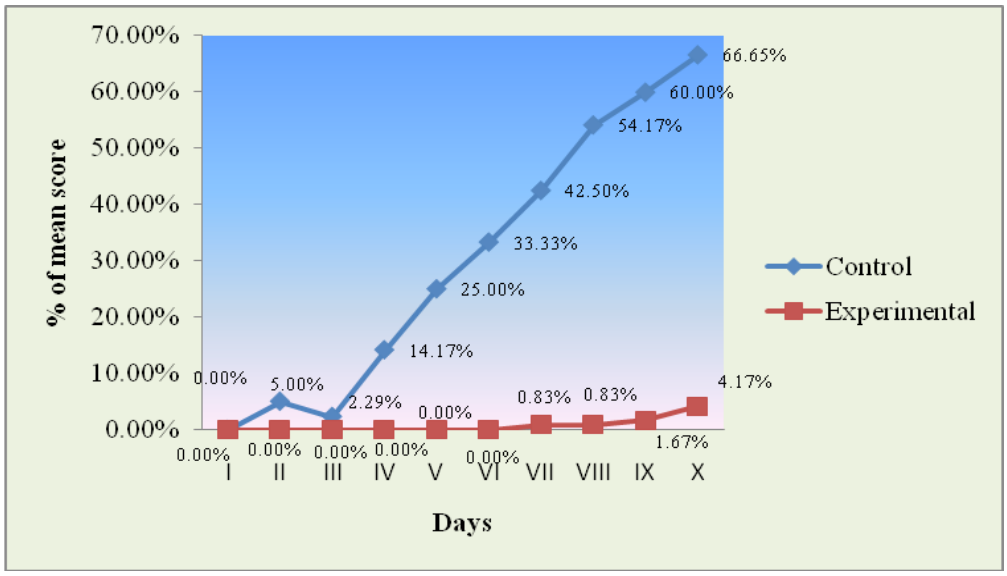
Table 2: Day-by day scores of oral mucositis of control group

Day	Minimum score	Maximum score	Mean	Mean %	S.D
I	0	4	0	0	0
II	0	4	0.2	5	0.4068
III	0	4	0.3666	2.29	0.6296
IV	0	4	0.5666	14.165	0.6260
V	0	4	1	25	0.7877
VI	0	4	1.3333	33.3325	0.6607
VII	0	4	1.7	42.5	0.7943
VIII	0	4	2.1666	54.165	0.5085
IX	0	4	2.4	60	2.8342
X	0	4	2.6666	66.65	0.6608

Table 3: Day-by day scores of oral mucositis of experimental group

Day	Minimum score	Maximum score	Mean	Mean %	S.D
I	0	4	0	0	0
II	0	4	0	0	0
III	0	4	0	0	0
IV	0	4	0	0	0
V	0	4	0	0	0
VI	0	4	0	0	0
VII	0	4	0.033	0.8325	0.1795
VIII	0	4	0.033	0.8325	0.1795
IX	0	4	0.0666	1.665	0.2451
X	0	4	0.1666	4.165	0.3865

Fig. 9: Line diagram showing the comparison of mean percentage score obtained oral mucositis scale

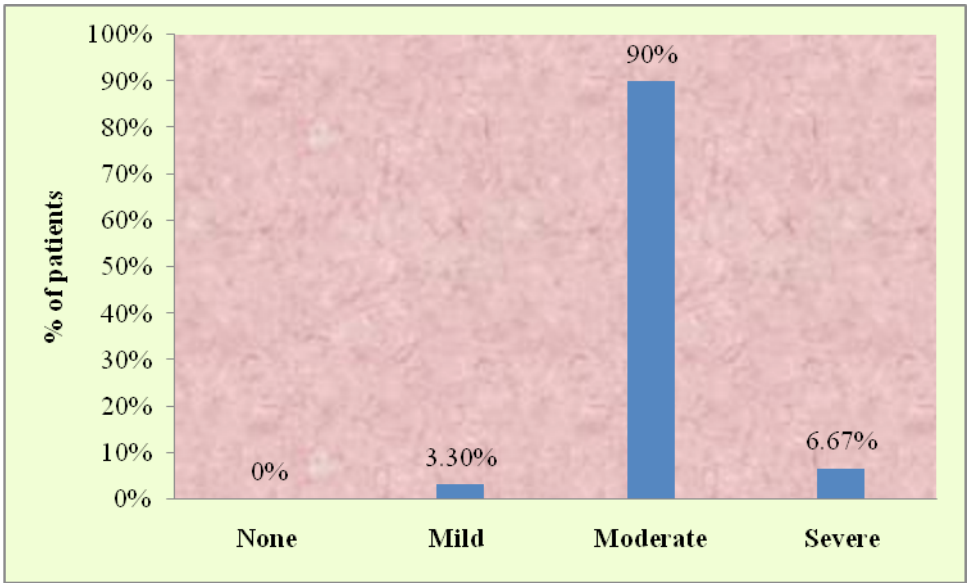


The above diagram shows that, in experimental group the mean score on 1 day to VII day 0, on the VII-day 0.033, on the VIII-day 0.033, on the IX day 0.06666 and on the X day 0.1666. In control group the mean score on the II day 0.2, on the III day 0.3666, on the IV day 0.5666, on the V day 1, on the VI day 1.3333, on the VII day 1.7 on the VIII day, on the IX day 2.4 and on the X day 2.666.

Table 4: Grading of oral mucositis on the 10th day among control group

Grade	Number of sample	%
None (0)	0	0%
Mild (0-1)	1	3.3%
Moderate (2-3)	27	90%
Severe (4)	2	6.67%

Fig. 10: Cylindrical diagram shows the level of mucositis on control group

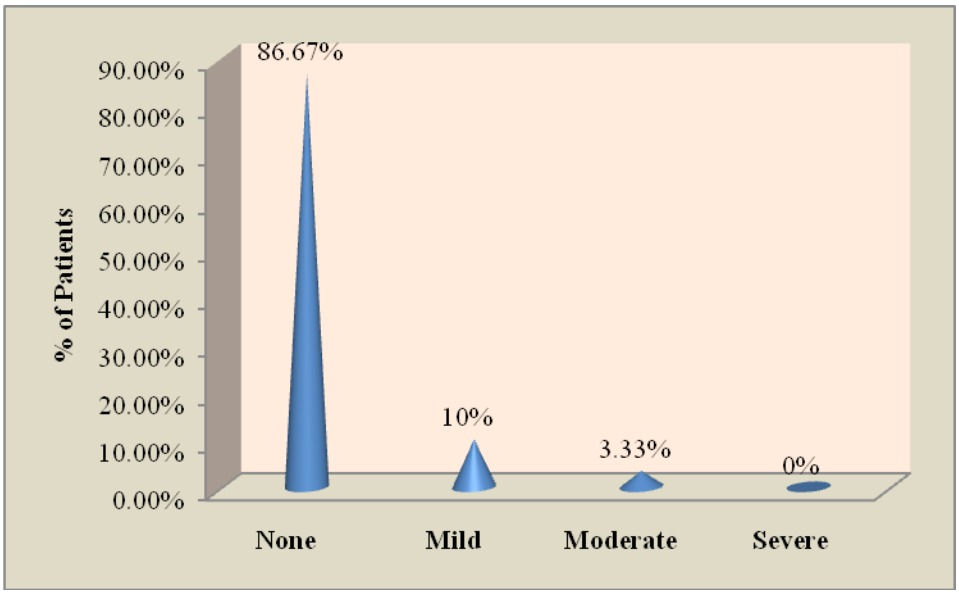


The above diagram shows that, in control group on 10th day none of patients are without oral mucositis, 3.30% of patients have developed mild grade, of oral mucositis, 90% of patients have developed moderate grade of oral mucositis, 90% of patients have developed moderate grade of oral mucositis and 6.67% of patients have developed severe grade of oral mucositis.

Table 5: Grading of oral mucositis on the 10th day among Experimental group

Grade	Number of sample	%
None (0)	26	86.67%
Mild (0-1)	3	10%
Moderate (2-3)	1	3.33%
Severe (4)	0	0%

Fig. 11: Conical diagram shows the level of mucositis on Experimental group



The above diagram shows that, in experimental group on 10th day 10% of patients have developed mild grade of oral mucositis and 3.33% of patients have developed moderates grade of oral mucositis.

SECTION - III

Table 6: Day – by – day comparison of grading of oral mucositis between control group and experimental group

Day	Group	Mean	Mean Difference	S.D	't' value	Significance
I	Experimental		-	-	-	-
	Control					
II	Experimental		-	-	-	-
	Control					
III	Experimental		-	-	-	-
	Control					
IV	Experimental		-	-		-
	Control					
V	Experimental		-	-	-	-
	Control					
VI	Experimental		-		-	-
	Control					
VII	Experimental	0.033	1.667	0.5758179	11.212345	Significant
	Control	1.7				
VIII	Experimental	0.033	2.1336	0.3813085	3.34416858	Significant
	Control	2.1666				
IX	Experimental	0.0666	2.1	2.0116112	4.4928805	Significant
	Control	2.1666				
X	Experimental	0.1666	2.4994	0.5413126	17.887014	Significant
	Control	2.666				

SECTION IV

Table 7: Association between grading of oral mucositis on 10th day of control group and demographic variables

S. No.	Demographic Variables	Grading of oral mucositis								Chi-Square Value	Significance
		No Mucositis		Mild Mucositis		Moderate Mucositis		Severe Mucositis			
		N	%	N	%	N	%	N	%		
1.	Age (in years)									χ^2 = 8.743 Df=6	Not Significant P>0.05
	a) 18-29	0	0	1	16.67	5	83.33	0	0		
	b) 30-41	0	0	0	0	8	100	0	0		
	c) 42-53	0	0	0	0	9	81.81	2	18.19		
	d) 54-65	0	0	0	0	5	100	0	0		
2.	Sex										
	a) Male	0	0	1	11.11	8	88.89	0	0	χ^2 = 2.928 Df=2	Not Significant P>0.05
	b) Female	0	0	0	0	19	90.48	2	9.52		
3.	Occupation										
	a) Cooly	0	0	0	0	17	94.44	1	1.55	**χ^2 = 20.750 Df=6**	**Significant P<0.05**
	b) Business man	0	0	0	0	3	100	0	0		
	c) Private employee	0	0	1	20	3	60	1	20		
	d) Govt. employee	0	0	0	0	4	100	0	0		
4.	Frequency of mouth wash										
	a) Once a day	0	0	0	0	7	100	0	0	χ^2 = 4.726 Df=6	Not Significant P>0.05
	b) Twice a day	0	0	1	11.11	8	88.88	0	0		
	c) Every time after eating	0	0	0	0	12	85.71	2	14.28		
	d) Any specific	0	0	0	0	0	0	0	0		

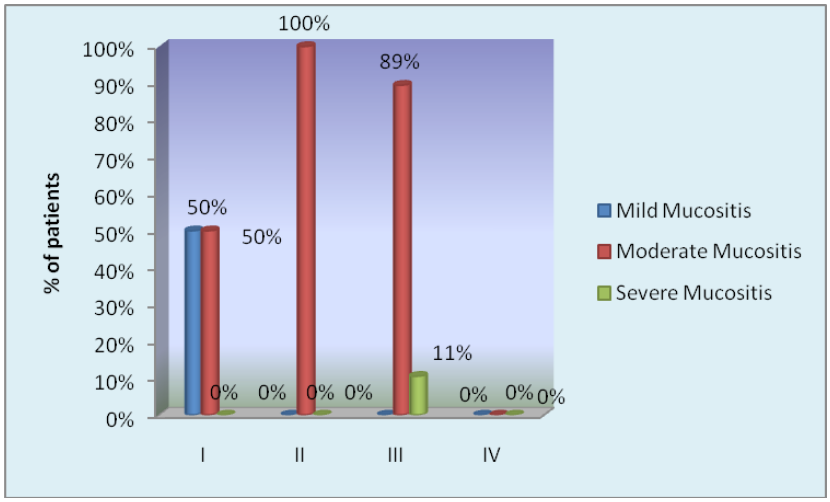
S. No.	Demographic Variables	Grading of oral mucositis								Chi-Square Value	Significance
		No Mucositis		Mild Mucositis		Moderate Mucositis		Severe Mucositis			
		N	%	N	%	N	%	N	%		
5	Frequency of Brushing										
	a) Once a day	0	0	0	0	22	91.67	2	8.33	χ^2 = **11.737** **Df=3**	**Significant** **P<0.05**
	b) Twice a day	0	0	0	0	5	83.33	0	0		
	c) Every time after eating	0	0	0	0	0	0	0	0		
	d) Any specific	0	0	0	0	0	0	0	0		
6	Personal habits										
	a) Smoking	0	0	1	16.66	5	83.33	0	0	χ^2 = 4.753 Df=4	Not Significant P>0.05
	b) Alcoholism	0	0	0	0	1	100.00	0	0		
	c) Betal chewing	0	0	0	0	21	91.30	2	8.69		
7	Chemotherapy drugs										
	a) Cisplatin	0	0	0	0	12	92.30	1	7.692	χ^2 = 5.017 Df=6	Not Significant P>0.05
	b) Cyclophosphamide	0	0	0	0	4	80	1	20		
	c) Docetaxel	0	0	0	0	4	100	0	0		
	d) Vinblastine sulphate	0	0	1	12.5	7	87.5	0	0		
8	Stages of cancer										
	a) I	0	0	1	50	1	50	0	0	χ^2 = **30.946** **Df=6**	**Significant** **P<0.05**
	b) II	0	0	0	0	9	100	0	0		
	c) III	0	0	0	0	17	89.48	2	10.52		
	d) IV	0	0	0	0	0	0	0	0		
9	Received chemotherapy										
	a) 1-5 times	0	0	1	25	3	75	0	0	χ^2 = **15.124** **Df=6**	**Significant** **P<0.05**
	b) 5-10 times	0	0	0	0	5	100	0	0		
	c) 10-15 times	0	0	0	0	10	83.3	2	16.66		

	d) Above 15 times	0	0	0	0	9	100	0	0		

S. No.	Demographic Variables	Grading of oral mucositis								Chi-Square Value	Significance
		No Mucositis		Mild Mucositis		Moderate Mucositis		Severe Mucositis			
		N	%	N	%	N	%	N	%		
10	What is the duration of illness?										
	a) Less then 1 yr	0	0	1	50	1	50	0	0	χ^2 = 17.714 Df=6	Significant P<0.05
	b) 1-4 yrs	0	0	0	0	13	100	0	0		
	c) 4-9 yrs	0	0	0	0	10	90.90	1	9.09		
	d) Above 8 yrs	0	0	0	0	3	75	1	25		
11	Types of cancer										
	a) Thyroid cancer	0	0	1	11.11	8	88.88	0	0	χ^2 = 4.726 Df=6	Significant P<0.05
	b) Breast cancer	0	0	0	0	5	100	0	0		
	c) Cancer of cervix	0	0	0	0	12	85.71	2	14.28		
	d) Lung cancer	0	0	0	0	2	100	0	0		

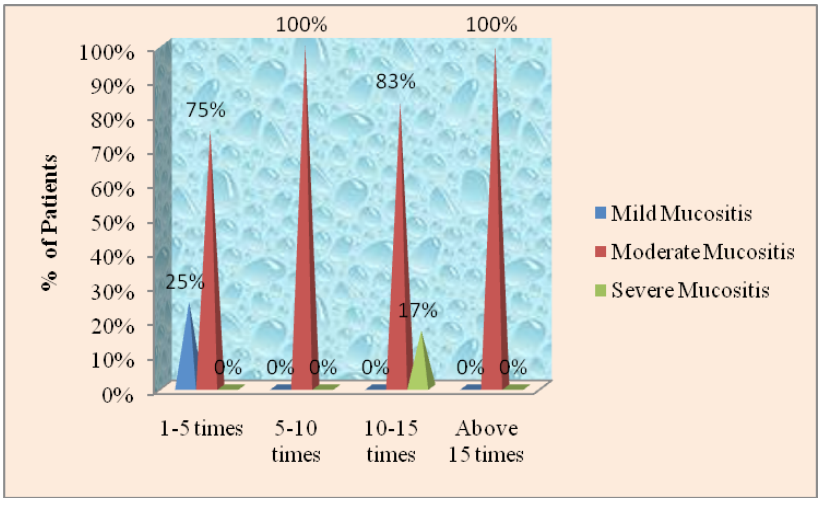
The above table shows that in control group there is significant relationship between prevention of oral mucositis and demographic variables occupation, frequency of brushing, stages of cancer, chemotherapy and duration of illness. There is no significant relationship between prevention of oral mucositis and demographic variables age, sex, mouth wash, personal habits, chemotherapy drugs, and types of cancer.

Fig. 12 : Cylindrical diagram showing the association between stages of cancer and oral mucositis (Control group)



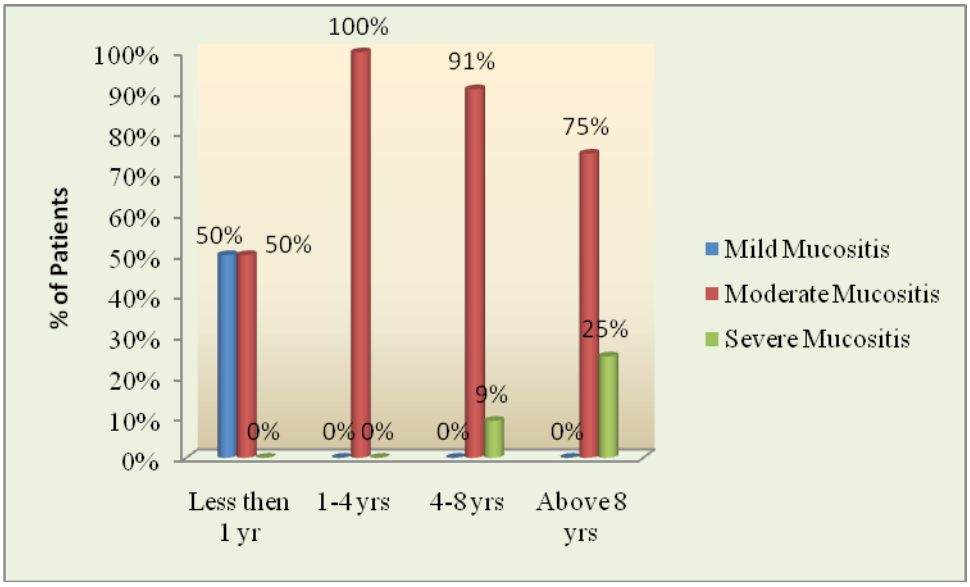
The above diagram shows that, in control group there is significant association between stages of cancer and level of oral mucositis.

Fig. 13 : Pyramidal diagram showing the association between chemotherapy and oral mucositis (Control group)



The above diagram shows that, in control group there is significant association between chemotherapy and level of oral mucositis.

Fig. 14 : Cylindrical diagram showing the association between duration of illness and oral mucositis (Control group)



The above diagram shows that, in control group there is significant association between duration of illness and oral mucositis.

Table 8 : Association between grading of oral mucositis on 10th day of Experimental group and demographic variables

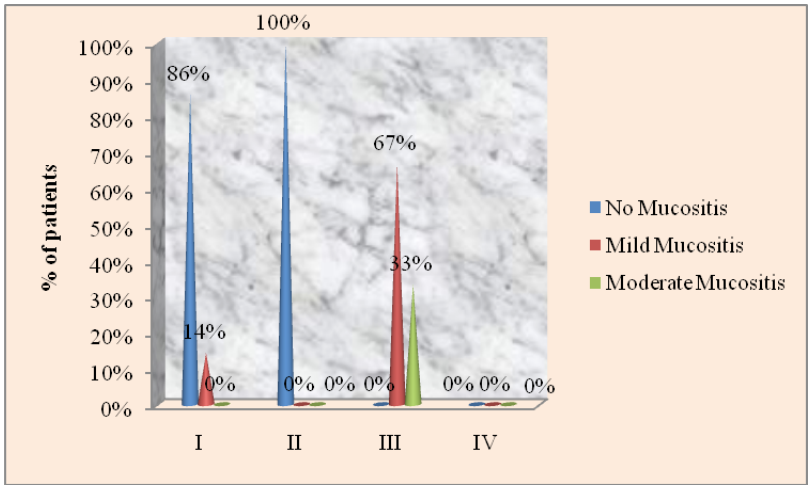
S. No.	Demographic Variables	Grading of oral mucositis								Chi-Square Value	Significance
		No Mucositis		Mild Mucositis		Moderate Mucositis		Severe Mucositis			
		N	%	N	%	N	%	N	%		
1.	Age (in years)									χ^2 = 7.285 Df=6	Not Significant P>0.05
	a) 18-29	5	83.3	1	16.7	0	0	0	0		
	b) 30-41	8	88.9	1	11.1	0	0	0	0		
	c) 42-53	10	90.9	1	9.1	0	0	0	0		
	d) 54-65	3	75	0	0	1	25	0	0		
2.	Sex									χ^2 = 1.786 Df=2	Not Significant P>0.05
	a) Male	9	81.8	2	18.2	0	0	0	0		
	b) Female	17	89.47	1	5.26	1	5.26	0	0		
3.	Occupation									χ^2 = 2.343 Df=6	Not Significant P>0.05
	a) Cooly	14	82.35	2	11.76	1	5.89	0	0		
	b) Business man	3	100	0	0	0	0	0	0		
	c) Private employee	5	100	0	0	0	0	0	0		
	d) Govt. employee	4	80	1	20	0	0	0	0		
4.	Frequency of mouth wash									**χ^2 = 29.239 Df=6**	**Significant P>0.05**
	a) Once a day	0	0	3	75	1	25	0	0		
	b) Twice a day	4	100	0	0	0	0	0	0		
	c) Every time after eating	22	91.7	0	0	0	0	0	0		
	d) Any specific	0	0	0	0	0	0	0	0		

S. No.	Demographic Variables	Grading of oral mucositis								Chi-Square Value	Significance
		No Mucositis		Mild Mucositis		Moderate Mucositis		Severe Mucositis			
		N	%	N	%	N	%	N	%		
5	Frequency of Brushing									χ^2 = 4.259 Df=4	Not Significant P>0.05
	a) Once a day	8	88.9	0	0	1	11.11	0	0		
	b) Twice a day	15	88.23	2	11.77	0	0	0	0		
	c) Every time after eating	3	75	1	25	0	0	0	0		
	d) Any specific	0	0	0	0	0	0	0	0		
6	Personal habits									χ^2 = 2.114 Df=4	Not Significant P>0.05
	a) Smoking	6	85.71	1	14.29	0	0	0	0		
	b) Alcoholism	3	75	1	25	0	0	0	0		
	c) Betal chewing	17	89.48	1	5.26	1	5.26	0	0		
7	Chemotherapy drugs									χ^2 = 5.474 Df=6	Not Significant P>0.05
	a) Cisplatin	7	87.5	1	12.5	0	0	0	0		
	b) Cyclophosphamide	7	100	0	0	0	0	0	0		
	c) Docetaxel	4	66.6	1	16.7	1	16.7	0	0		
	d) Vinblastine sulphate	8	88.8	1	11.1	0	0	0	0		
8	Stages of cancer									**χ^2 23.772 Df=4**	**Significant P<0.05**
	a) I	6	85.71	1	14.29	0	0	0	0		
	b) II	20	100	0	0	0	0	0	0		
	c) III	0	0	2	66.7	1	33.3	0	0		
	d) IV	0	0	0	0	0	0	0	0		
9	Received chemotherapy									**χ^2 = 19.362 Df=4**	**Significant P<0.05**
	a) 1-5 times	10	90.91	1	9.09	0	0	0	0		
	b) 5-10 times	16	94.11	1	5.89	0	0	0	0		
	c) 10-15 times	0	0	1	50	1	50	0	0		
	d) Above 15 times	0	0	0	0	0	0	0	0		

S. No.	Demographic Variables	Grading of oral mucositis								Chi-Square Value	Significance
		No Mucositis		Mild Mucositis		Moderate Mucositis		Severe Mucositis			
		N	%	N	%	N	%	N	%		
10	What is the duration of illness?									χ^2 = **19.812** **Df=4**	**Significant** **P<0.05**
	a) Less than 1 yr	6	85.7	1	14.3	0	0	0	0		
	b) 1-4 yrs	20	95.23	1	4.77	0	0	0	0		
	c) 4-9 yrs	0	0	1	50	1	50	0	0		
	d) Above 8 yrs	0	0	0	0	0	0	0	0		
11	Types of cancer									χ^2 = 4.409 Df=4	Not Significant P>0.05
	a) Thyroid cancer	9	90	1	10	0	0	0	0		
	b) Breast cancer	6	85.71	1	14.29	0	0	0	0		
	c) Cancer of cervix	8	88.8	0	0	1	11.2	0	0		
	d) Lung cancer	3	75	1	25	0	0	0	0		

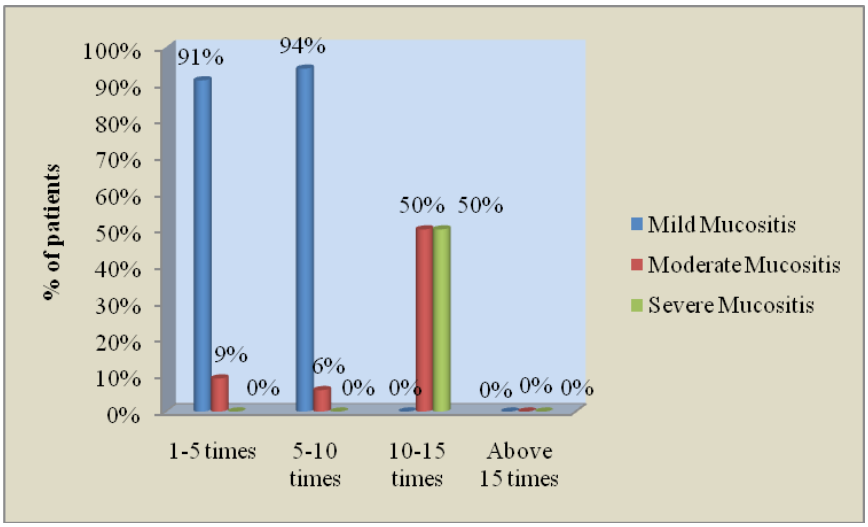
The above table shows that in experimental group there is significant relationship between prevention of oral mucositis and demographic variables frequency of mouth wash, stages of cancer, chemotherapy and duration of illness. There is no significant relationship between prevention of oral mucositis and demographic variables age, sex, occupation, frequency of brushing, personal habits, chemotherapy drugs, and types of cancer.

Fig. 15 : Conical diagram showing the association between stages of cancer and oral mucositis (Experimental group)



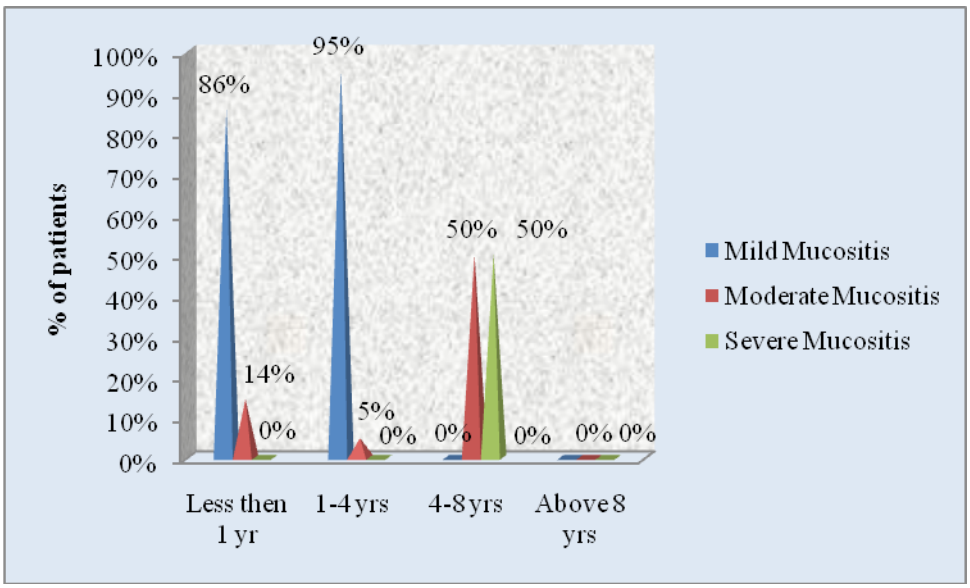
The above diagram shows that, in experimental group there is significant association between stages of cancer and level of oral mucositis.

Fig. 16 : Cylindrical diagram showing the association between chemotherapy and oral mucositis (Experimental group)



The above diagram shows that, in experimental group there is significant association between chemotherapy and level of oral mucositis.

Fig. 17 : Pyramidal diagram showing the association between duration of illness and oral mucositis (Experimental group)



The above diagram shows that, in experimental group there is significant association between duration of illness and level of oral mucositis.

CHAPTER V
DISCUSSION, IMPLICATIONS AND CONCLUSION

This chapter deals with the discussion of the study with appropriate literature review, statistical analysis and findings of the study based on objective of the study. The aim of the study was on prevention of oral mucositis among patients receiving chemotherapy admitted to the ECC hospital, Thindal at Erode district. A quantitative approach was adopted for this study and purposive sampling techniques were used to collect the samples. The data was collected from 60 patients.

The findings of the study have been discussed with reference to the objectives.

MAJOR FINDINGS OF THE STUDY:

1. **The first objective of the study was to assess the degree of occurrence of oral mucositis among patients receiving chemotherapy who receive normal saline mouth wash.**

In experimental group after giving normal saline mouth wash. On 10^{th} day one subject (3.33%) had developed moderate oral mucositis, and one subject (3.33%) had developed mild oral mucositis.

2. **The second objective was to assess the degree of occurrence of oral mucositis among patients receiving chemotherapy who do not receive normal saline mouth wash.**

On 10th day, 2 (6.67%) of the samples had developed severe oral mucositis, 27 (90%) of the samples had developed moderate oral mucositis and one subject (3.3%) had developed mild oral mucositis in the control group

3. **The third objective was to evaluate the effectiveness of normal saline mouth wash by comparing the occurrence of oral mucositis among the patients of experimental group and control group.**

The mean difference between experimental and control group on 7th day 1.667, 8th day 2.1336, 9th day 2.1 and 10th day 2.4994.

Calculated the't' value on 7th day, 11.80035219 on 8th day t value 3.78760275, on 9th day t value 4.526250023, and on 10th day t value 25.54773056.

Hajizadeh, 2009, conducted study alloporinol, Chamomile and normal saline mouthwashes for prevention of chemotherapy induced mucositis in that chamomile (group 2) or normal saline (group 3). ANOVA and 2 tests have been used for data analysing. Results, Significant differences were obtained between allopurinol, chamomile and normal saline groups in scores of severity of mucositis (p=0.017), mucositis pain (p=0.027) and persistence of mucositis. No significant differences noted among the mean stomatitis (p=0.59) and mucositis pain (0.071) severity scores between group 1 and group 2. Conclusions. These findings indicate equal efficacy of allopurinol and chamomile in prevention of chemotherapy-induced mucositis compared to

normal saline control group. Considering the cost and easy accessibility of normal saline and potential therapeutic applicability in reduction of the severity of chemotherapy-induced, it's implied.

Since there is significant difference between experimental and control group in the occurrence of oral mucositis, hence H_1 is accepted, (normal saline mouth wash is effective in preventing the occurrence of oral mucositis among patients receiving chemotherapy).

4. **The fourth objective was to find out the association between the occurrence of oral mucositis among patients and their selected demographic variables:**

In control group the chi-square value for the occupation χ^2=20.750, frequency of brushing χ^2 =11.737, stages of cancer χ^2 =30.646, received chemotherapy χ^2 =15.124, and duration of illness χ^2 =17.716.

Hence, there is significant association between the occurrence of oral mucositis and selected demographic variables as occupation, frequency of brushing, stages of cancer, received chemotherapy and duration of illness.

In experimental group the chi square value of the frequency of mouth wash χ^2 =19.551, stages of cancer χ^2 =23.772, chemotherapy $x^{2=}$19.362, and duration of illness χ^2=19.812.

Hence, there is significant association between the occurrence of oral mucositis and selected demographic variables as the frequency of mouth wash, stages of cancer, chemotherapy and duration of illness.

IMPLICATION OF THE STUDY:

A research finding is not just to prove the hypothesis framed, it is to implicate the practice for the well being of human. The researcher would like to implicate the research findings into various aspects such as nursing practice, nursing education, nursing administration and nursing research for the upcoming level of professionalism.

Nursing practice:

"Practice makes man perfect". The positive result of the current study can be practiced in respect to prevent oral mucositis by using normal saline mouth wash as a routine nursing care to those clients receiving chemotherapy. It can be made as mandatory for all cancer units to be followed as a basic routine part. It is a prime responsibility for every nurse to preserve the client self image by their effort which is a basic foundation for the client-nurse relationship.

Nursing education:

"Education brings a change in the behavior of one".

The nursing curriculum entitles the personal hygiene which is a basic need to be satisfied. According to the Maslow hierarchy needs the personal

hygiene is a primary need which is to be satisfied without neglection. It is an important responsibility of every nurse to satisfy the need expected to be satisfied in the clients. The cancer patients need to maintain the oral mucosal integrity which is to be satisfied and understand by all the nurses.

Nursing administration:

A protocol can be prepared to use the normal saline mouth wash as a part of care to those under chemotherapy medication, which essentially needs a nursing administrator to organize the continuing nursing education programme to enforce this apart in nursing care.

Nursing research:

It is very important for nursing research to have a detailed study about certain measures which prevent the clients from oral mucositis, through those measures like normal saline mouth wash are of with low cost shows high effect. The emerging trend of evidence based nursing is a key which can be triggered by a broad sensation of further researcher.

RECOMMENDATION:

- A comparative study can be performed to evaluate the effectiveness of different oral mouth wash, providone iodine, chlorhexidine, normal saline.

- A similar study can be replicated with a control group on large sample.
- Same study can be repeated on patient taking radiation therapy for head and neck cancer.

CONCLUSION:

"A perfect stitch makes a perfect body". The research findings of the present study have proved that the normal saline mouth wash is effective in preventing the client from the occurrence of oral mucositis among those who are receiving chemotherapy. Thus it is getting from the verb that, "prevention is better than cure", the nurse who is taking care of a client can prevent their clients from oral mucositis thus preserves the client self image and gives way to the client to be esteemed one.

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ANNEXURE - I

Phone : 04256 - 247321

SRI ADICHUNCHANAGIRI SHIKSHANA TRUST

DHARMARATHNAKARA Dr. MAHALINGAM INSTITUTE OF PARAMEDICAL SCIENCES & RESEARCH

(Kannada Linguistic Minority Institution)

Sakthinagar - 638 315. Bhavani Taluk, Erode District, Tamilnadu.

Ref. No. : *Date* .....

LETTER SEEKING PERMISSION TO CONDUCT PILOT STUDY

From

Mr.Abi Packiason C, M.Sc., (N) II Year,
(Speciality – Medical Surgical Nursing),
Dr. Mahalingam College of Nursing,
Sakthi Nagar (Po),
Bhavani (TK), Erode (DT),
Tamilnadu.

To

DR. ponnusamy K.P,
Ramya hospital,
Nambiyur,

Permitted

Dr.K.R.PONNUSAMY, M.B.B.S.,
Registered Medical Practitioner
Reg No.35281
Ramya Nursing Home,
Nambiyur - 638458

PRINCIPAL
College of Nursing
Sri Adichunchanagiri Shikshana Trust
Dharmarathnakara Dr. Mahalingam Institute
of Paramedical Sciences & Research,
Sakthinagar, Bhavani Taluk,
Erode Dist. - 638 315.

Respected Sir / Madam,

SUB : Permission to conduct study - Reg.

- - - - -

I, the II year M.Sc., Nursing student of Dr. Mahalingam College of Nursing, Sakthi Nagar. As a partial fulfillment of Master of Science in Nursing, I have undertaken the following research study, which has to be submitted to The Tamilnadu Dr.M.G.R.Medical University, Chennai.

RESEARCH STUDY:

"A STUDY TO DETERMINE THE EFFECTIVENESS OF NORMAL SALINE MOUTH WASH ON PREVENTION OF ORAL MUCOSITIS AMONG PATIENTS RECEIVING CHEMOTHERAPY IN SELECTED HOSPITALS AT KANYAKUMARI DIST"

...2...

Phone : 04256 - 247321

SRI ADICHUNCHANAGIRI SHIKSHANA TRUST

DHARMARATHNAKARA Dr. MAHALINGAM INSTITUTE OF PARAMEDICAL SCIENCES & RESEARCH

(Kannada Linguistic Minority Institution)

Sakthinagar - 638 315. Bhavani Taluk, Erode District, Tamilnadu.

Ref. No. :

Date .....

I kindly request you to permit me conduct the study on the effectiveness of normal saline mouth wash on prevention of Oral mucositis among patients receiving chemotherapy at your esteemed hospital with effect from 18/08/14 to 28/08/14.

I kindly request you to permit me to conduct the proposed study. Please, kindly do the needful.

Thanking you,

Date :

Place :

Yours Sincerely,

Abi packiason.c.

(ABI PACKIASON C)

Head Office : Sri Adichunchanagiri Shikshana Trust®, Sri Adichunchanagiri Kshethra. PIN : 571 811.
Nagamangala Taluk, Mandiya Dist., Karnataka.

ANNEXURE – II

Phone : 04256 - 247321

SRI ADICHUNCHANAGIRI SHIKSHANA TRUST

DHARMARATHNAKARA Dr. MAHALINGAM INSTITUTE OF PARAMEDICAL SCIENCES & RESEARCH

(Kannada Linguistic Minority Institution)

Sakthinagar - 638 315. Bhavani Taluk, Erode District, Tamilnadu.

Ref. No. :

Date .....

LETTER SEEKING PERMISSION TO CONDUCT STUDY

From

Mr.Abi Packiason C, M.Sc., (N) II Year,
(Speciality – Medical Surgical Nursing),
Dr. Mahalingam College of Nursing,
Sakthi Nagar (Po),
Bhavani (TK), Erode (DT),
Tamilnadu.

Permitted

Dr.K.VELAVAN, M.D.,R.T.,
Reg No.52088
Consultant Oncologist,
Erode Cancer Center, Erode.

PRINCIPAL
College of Nursing
Sri Adichunchanagiri Shikshana Trust
Dharmarathnakara Dr. Mahalingam Institute
of Paramedical Sciences & Research,
Sakthinagar, Bhavani Taluk,
Erode Dist. - 638 315.

To

DR. K. Velavan. MD, RT
Consultant oncologist
Erode Cancer Centre, Erode.

Respected Sir / Madam,

SUB : Permission to conduct study - Reg.

- - - - -

I, the II year M.Sc., Nursing student of Dr. Mahalingam College of Nursing, Sakthi Nagar. As a partial fulfillment of Master of Science in Nursing, I have undertaken the following research study, which has to be submitted to The Tamilnadu Dr.M.G.R.Medical University, Chennai.

RESEARCH STUDY:

"A STUDY TO DETERMINE THE EFFECTIVENESS OF NORMAL SALINE MOUTH WASH ON PREVENTION OF ORAL MUCOSITIS AMONG PATIENTS RECEIVING CHEMOTHERAPY IN SELECTED HOSPITALS AT KANYAKUMARI DIST"

...2...

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Nagamangala Taluk, Mandiya Dist., Karnataka.

Phone : 04256 - 247321

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(Kannada Linguistic Minority Institution)

Sakthinagar - 638 315. Bhavani Taluk, Erode District, Tamilnadu.

Ref. No. :

Date .....

I kindly request you to permit me conduct the study on the effectiveness of normal saline mouth wash on prevention of Oral mucositis among patients receiving chemotherapy at your esteemed hospital with effect from 28/9/14 --- to --- 6/10/14.

I kindly request you to permit me to conduct the proposed study. Please, kindly do the needful.

Thanking you,

Date : 28.9.14

Place : Sakthi nagar.

Yours Sincerely,

Abi packiason. C.

(ABI PACKIASON C)

ANNEXURE - III

CONTENT VALIDITY CERTIFICATE

This is to certify that the student ABI PACKIASON C, S/o.Mr.Christoper Gold Moses studying in M.Sc., (N) II year Post Graduate Degree Course at Dharmarathnakara Dr.Mahalingam Institute of Paramedical Sciences & Research, Sakthi Nagar.

Topic Entitled:

"A STUDY TO DETERMINE THE EFFECTIVENESS OF NORMAL SALINE MOUTH WASH ON PREVENTION OF ORAL MUCOSITIS AMONG PATIENTS RECEIVING CHEMOTHERAPY IN SELECTED HOSPITALS AT ERODE DIST"

Date: 20.2.2015
Place: SakthiNagal.

D. Thilagi
Signature of Guide with seal

HEAD OF THE DEPARTMENT
Medical Surgical Nursing,
Dharmarathnakara Dr.Mahalingam
College of Nursing,
Sakthi Nagar.

Phone : 04256 - 247321

SRI ADICHUNCHANAGIRI SHIKSHANA TRUST

DHARMARATHNAKARA Dr. MAHALINGAM INSTITUTE OF PARAMEDICAL SCIENCES & RESEARCH
(Kannada Linguistic Minority Institution)
Sakthinagar - 638 315. Bhavani Taluk, Erode District, Tamilnadu.

Ref. No. :

Date.....

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Topic Entitled:

"A STUDY TO EVALUATE THE EFFECTIVENESS OF VIDEO ASSISTED TEACHING IN SELF ADMINISTATION OF INSULIN AMONG PATIENTS WITH TYPE I DIABETES MELLITUS IN SELECTED HOSPIALS AT KANYAKUMARI DIST"

Date:

Place:

Signature of Expert with seal

Late Pandurang Patil Nursing College
No.....
Dt.....
Akola

PRINCIPAL
Late Pandurang Patil Nursing College, At Post-Kanheri (Sarap)
DIST. AKOLA

Head Office : Sri Adichunchanagiri Shikshana Trust®, Sri Adichunchanagiri Kshethra. PIN : 571 811.
Nagamangala Taluk, Mandiya Dist., Karnataka.

Phone : 04256 - 247321

SRI ADICHUNCHANAGIRI SHIKSHANA TRUST

DHARMARATHNAKARA Dr. MAHALINGAM INSTITUTE OF PARAMEDICAL SCIENCES & RESEARCH
(Kannada Linguistic Minority Institution)
Sakthinagar - 638 315. Bhavani Taluk, Erode District, Tamilnadu.

Ref. No. :

Date .....

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Topic Entitled:

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Date:

Place:

Signature of Expert with seal

Late Pandurang Patil Nursing College
No.....
Dt.....
★ Akola ★

H. O. D.
Deptt. of Medical Surgical Nursing
Late P. P. N. C., AKOLA

Head Office : Sri Adichunchanagiri Shikshana Trust®, Sri Adichunchanagiri Kshethra. PIN : 571 811.
Nagamangala Taluk, Mandiya Dist., Karnataka.

Phone : 04256 - 247321

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Topic Entitled:

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Date:

Place:

Signature of guide with seal

Head Office : Sri Adichunchanagiri Shikshana Trust®, Sri Adichunchanagiri Kshethra. PIN : 571 811. Nagamangala Taluk, Mandiya Dist., Karnataka.

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Date: 28/9/14

Place: Sakthinagar.

S. Maheswaran 75118.

Signature of expert with seal

(Dr.S. MAHESHRAJA)

Medical Officer,
VMK Hospital,
Sakthi Nagar.

CERTIFICATE BY THE EDITOR

This is to certify that the dissertation entitled "A STUDY TO DETERMINE THE EFFECTIVENESS OF NORMAL SALINE MOUTH WASH ON PREVENTION OF ORAL MUCOSITIS AMONG PATIENTS RECEIVING CHEMOTHERAPY IN SELECTED HOSPITAL, ERODE DISTRICT" is a bonafide research work done by Mr.C. Abe Packiason II Year, M.Sc, (Nursing) student of Dharmarathnakara Dr.Mahalingam Institute of Paramedical Sciences & Research, Sakthi Nagar, Bhavani Taluk, Erode District. Mrs.T.S.Sumithra Devi., M.A., (M.Phil) edited this manuscript on behalf of the partial fulfillment of the prerequisite for the degree of **Master of Science in Nursing** (Medical Surgical Nursing).

Date : 17/02/2015

Place : Sakthi Nagar

17/2/15

Signature of Editor

CONTENT VALIDITY CERTIFICATE

This is to certify that the student ABI PACKIASON C, S/o.Mr.Christoper Gold Moses studying in M.Sc., (N) II year Post Graduate Degree Course at Dharmarathnakara Dr.Mahalingam Institute of Paramedical Sciences & Research, Sakthi Nagar.

Topic Entitled:

"A STUDY TO DETERMINE THE EFFECTIVENESS OF NORMAL SALINE MOUTH WASH ON PREVENTION OF ORAL MUCOSITIS AMONG PATIENTS RECEIVING CHEMOTHERAPY IN SELECTED HOSPITALS AT ERODE DIST"

Date: 14.8.2014

Place: Erode.

K. Dhanapal

Signature of expert with seal

Professor of Statistics.

ANNEXURE – VI

SECTION – I

DEMOGRAPHIC PROFORMA

Sample No :

1) Age (in years)

   a) 18-29 [ ]

   b) 30-41 [ ]

   c) 42-53 [ ]

   d) 54-65 [ ]

2) Sex

   a. Male [ ]

   b. Female [ ]

3) Current occupation status :

   a. Cooly [ ]

   b. Business man [ ]

   c. Private employee [ ]

   d. Government employee [ ]

4) Frequency of mouth wash

   a. Once a day [ ]

   b. Twice a day [ ]

   c. Every time after eating [ ]

   d. Any other schedule (specify) [ ]

5) Frequency of brushing

a. Once a day [ ]

b. Twice a day [ ]

c. Every time after eating [ ]

d. Any other schedule (specify) [ ]

6) Personal habits

a. Smoking [ ]

b. Alcoholism [ ]

c. Betal chewing [ ]

7) Chemotherapy drugs used

a. Cisplatine [ ]

b. Cyclophosphasmide [ ]

c. Docetaxel [ ]

d. Vinblastine sulphate [ ]

8) At which stage of cancer the patient is present

a. Ist [ ]

b. 2nd [ ]

c. 3rd [ ]

d. 4th [ ]

9) How many times you have received chemotheraphy before

a. 1-5 [ ]

b. 5-10 [ ]

c. 10-15 [ ]

d. Above 15 [ ]

10) What is the duration of illness?

a. less than 1 year [ ]

b. 1-4 years [ ]

c. 4-8 years [ ]

d. Above 8 years [ ]

11) Types of cancer

a. Throid cancer [ ]

b. Breast cancer [ ]

c. Cancer of cervix [ ]

d. Lung cancer [ ]

Tool- II W.H.O ORAL MUCOSITIS ASSESSMENT SCALE

The researcher will be using the following scale to assess the grade of mucositis in patients receiving chemotherapy after thoroughly inspecting their oral cavity on the 10^{th} day of their chemotherapy cycle.

Grade 0	Grade 1	Grade 2	Grade 3	Grade 4
None	Soreness + Erythema	Erythema, ulcers, can eat solid food	Ulcers with extensive erthema, liquid diet only	No possible alimentation

gFjp -1

r\fk; rhh;e;j Ratptuk;:

1. taJ (tUl';fspy;)

   m. 18-29 [ ]

   M. 30-41 [ ]

   ,. 42-53 [ ]

   <. 54-65 [ ]

2. ghypdk;

   m. Mz; [ ]

   M. bgz; [ ]

3. jw;nghija bjhHpy; epiy

   m. Typ [ ]

   M. tpahghhp [ ]

   ,. jdpahh; bjhHpyhsp [ ]

   <. muR CHpah; [ ]

4. xU ehisf;F vj;jid Kiw c';fs; thia Rj;jg;gLj;JtPh;fs;>

   m. xU jlit [ ]

   M. ,uz;L jlit [ ]

   ,. rhg;gpl;l gpwF [ ]

<. ntW VjhtJ gHf;f Kiw (tpsf;ft[k;) [ ]

5. xU ehisf;F vj;jid Kiw gy; Jyf;FtPh;fs;>

m. xU jlit [ ]

M. ,uz;L jlit [ ]

,. rhg;gpl;l gpwF [ ]

<. ntW VjhtJ gHf;f Kiw (tpsf;ft[k;) [ ]

6. jdp kdpj gHf;f tHf;f';fs;

m. g[ifg;gHf;fk; [ ]

M. kJg;gHf;fk; [ ]

,. btw;wpiyghf;F [ ]

7. QPnkhbjugp kUe;Jfs;

m. rp!;gpyhl;od; [ ]

M. irf;nshgh!;ikL [ ]

,. lhf;lb$y; [ ]

<. tpd;gpsh!;od; ry;ngl; [ ]

8. j';fSf;F g[w;W neha; ve;j epiyapy; cs;sJ.

m. Kjy; [ ]

M. ,uz;lhtJ [ ]

,. \d;whtJ [ ]

<. ehd;fhtJ [ ]

9. ,jw;F Kd;dhy; vj;jid Kiw QPnkhbjugp vLj;Js;sPh;fs;>

m. 1-5 [ ]

M. 5-10 [ ]

,. 10-15 [ ]

<. 15 Kiwf;F nky; [ ]

10. c';fSila nehapd; epiy vg;bghGJ fz;lwpag;gl;lJ>

m. 1 tUlj;jpw;Fs; [ ]

M. 1-4 tUl';fs; [ ]

,. 4-8 tUl';fs; [ ]

<. 8 tUlj;jpw;F nky; [ ]

11. j';fSf;F ve;j g[w;Wneha; cs;sJ.

m. ijuha;L g[w;Wneha; [ ]

M. khh;gf g[w;Wneha; [ ]

,. fh;g;gg;ig g[w;Wneha; [ ]

<. EiuaPuy; g[w;Wneha; [ ]

gFjp -2

tha;g;g[z;iz kjpg;gpLjy;:

gphpt[- 0	gphpt[- 1	gphpt[-2	gphpt[- 4	gphpt[- 4
rpwpJk; ,y;iy	rpwpJ Rfkpd;ik	tha;g;g[z; , Ue;j nghjpYk; jplkhd cztpid cl;bfhs;s KofpwJ.	tha;g;g[z; mjpfkhf ,Ug;gjpdhy; jplkhd czt[g; bghUis cl;bfhs;s ,aytpy;iy.	tha;g;g[z; kpf mjpfkhf ,Ug;gjpdhy; jput cztpid cl;bfhs;s ,aytpy;iy.
