SJIF Impact Factor: 5.464

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 5.
Issue: 6.
Page N. 165-182
Year: 2021

Original Article www.wjahr.com

STUDY TO ASSESS THE EFFECTIVENESS OF AROMATHERAPY ON PAIN AND DEPRESSION AMONG PATIENTS RECEIVING CHEMOTHERAPY IN A SELECTED HOSPITAL, BANGALORE

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Received date: 21 September 2021 **Revised date:** 11 October 2021 **Accepted date:** 31 October 2021

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ABSTRACT

Background of The Study: Cancer, the scarier diagnosis in most people's minds is often thought of as an untreatable, unbearably painful disease with no cure. Cancer is undoubtedly a serious and potentially life-threatening illness. Cancer grows out of normal cells in the body. Complementary medicine is the term used to describe additional forms of treatment that may be given along with chemotherapy. In the past, complementary medicine has claimed various types of "miracle" cures for cancer. Aromatherapy is a form of complementary therapy that uses volatile plant materials, known as essential oils, and other aromatic compounds for the purpose of altering a person's mind, mood, cognitive function, or health. **Objectives:** assess the level of pain and depression among patients receiving chemotherapy. evaluate the effectiveness of aromatherapy on pain and depression among patients receiving chemotherapy and find the association between the findings and selected demographic variables. **Methodology:** To evaluate the effectiveness of aromatherapy on pain and depression among patients receiving chemotherapy a Quasi-experimental pre-test post-test research design was selected with Quantitative research approach. Nonprobability purposive Sampling was used. 60 Sample Size was taken. On day one, 30 samples were selected for the experimental group by purposive sampling technique. Each of the 30 samples were divided in to 3 groups, containing 10 samples each. Aromatherapy was started for each experimental group with 20 ml of almond oil mixed with 10 drops of lavender oil and 2 drops of geranium oil for 6 days. The oil was applied to the face, hands, chest, and scalp. On day seven, the post test was assessed. Likewise, each group was given aromatherapy. After completing the experimental group, 30 samples were selected for the control group. On day one, pre-test score was assessed. On day seven, the post test score was assessed. **Results:** The findings show a statistically difference in post-test pain and depression score on patients receiving chemotherapy after aromatherapy. **Conclusion:** Present study suggests that aromatherapy was effective in reducing level of pain and depression among patients receiving chemotherapy. The study also facilitated the researcher to recognize the role of aromatherapy in reducing pain and depression among patients receiving chemotherapy, which can be included into holistic nursing care

KEYWORDS: Effectiveness; Knowledge; Chemotherapy; Pain; Depression; Aromatherapy.

INTRODUCTION

"Life may not be the party we hoped for, but while we are here we might as well dance"
Emory Austin
(Breast Cancer Survivor)

Cancer, the scarier diagnosis in most people's minds is often thought of as an untreatable, unbearably painful disease with no cure. Cancer is undoubtedly a serious and potentially life-threatening illness. Cancer grows out of normal cells in the body. Normal cells multiply when the body needs them, and die when the body does not need them. Healthy cells control their own growth, and destroy themselves if they become unhealthy. Cancer appears to occur when the growth of cells in the body is out of control and cells divide too quickly. It can also occur when cells forget how to die.[1]

Cancer, known medically as a malignant neoplasm, is a term for a large group of different diseases, all involving unregulated cell growth forming malignant tumour, and invading nearby parts of the body. The cancer may also spread to more distant parts of the body through

the lymphatic system or bloodstream. Tumours are in two forms: benign and malignant. Benign tumours are not cancerous, thus they do not grow and spread to the extent of cancerous tumours. Benign tumours are usually not life threatening. Malignant tumours, on the other hand, grow and spread to other areas of the body.[2]

Many things are known to increase the risk of cancer including use of tobacco, infection, radiation, lack of physical activity, poor diet, obesity, environmental pollutants, chemical carcinogens, mutation, ionizing radiation, viral or bacterial infection, hormonal imbalances, immune system dysfunction, and heredity. Physical carcinogens such as ultraviolet and ionizing radiation; chemical carcinogens, such as asbestos, components of tobacco smoke, aflatoxin (a food contaminant) and arsenic (a drinking water contaminant); and the biological carcinogens such as infections from certain viruses, bacteria, or parasites, all these causes in turn lead to changes in gene mutation causing the normal cells to divide abnormally forming cancerous cells.[3]

Cancer staging is the process of determining the extent to which a cancer has developed by spreading. Contemporary practice is to assign a number from I-IV to a cancer, with I being an isolated cancer and IV being a cancer which has spread to the limit of what the assessment measures. Staging of cancer is determined by the extent or spread of the disease at the time of diagnosis. The staging system of tumour assesses tumours in three ways: size and extent of the primary tumour (T), absence or presence of regional lymph node involvement (N), and absence or presence of distant metastases (M). Once the TNM is determined, a stage of I, II, III, or IV is assigned, with stage I being early stage and stage IV being advanced. Numbers after the T – T_1 T_2, T_3, and T_4 – describe the tumour size. The N category describes whether the cancer has spread into nearby lymph nodes. N_X means that the nearby lymph nodes cannot be evaluated.N_0 means nearby lymph nodes do not contain cancer. Numbers after the N – N_1, N_2, and N_3 – describe the size, location, and the number of lymph nodes involved. The M category tells whether there are distant metastases. M_X means that metastasis cannot be evaluated. M_0 means that no distant cancer spread was found. M_1 means that the cancer has spread to distant organs or tissues.[4]

The major and minor symptoms of cancer can be local, systemic, and metastatic. The local symptoms include unusual lumps or swelling, haemorrhage, pain and ulceration. Compression of surrounding tissues may cause symptoms such as jaundice. Symptoms of metastasis are enlarged lymph nodes, cough and haemoptysis, hepatomegaly, bone pain, fracture of the affected bones and neurological symptoms. Although advanced cancer may cause pain, it is often not the first symptom. Systemic symptoms are weight loss, poor appetite, fatigue and cachexia, Cancer is usually treated with chemotherapy, radiation therapy, surgery, immune therapy, and biological therapy. The choice of therapy depends upon the location and grade of the tumour, the stage of the disease, as well as the general state of the patient. The chances of surviving the diseasesexcessive sweating, anaemia, specific paraneoplastic phenomena, thrombosis and hormonal changes.[5] vary greatly by the type and location of the cancer and the extent of disease at the start of treatment. Complete removal of the cancer without damage to the rest of the body is the goal of treatment. Sometimes this can be accomplished by surgery, but the propensity of cancers to invade adjacent tissue or to spread to distant sites by microscopic metastasis often limits its effectiveness. But chemotherapy and radiotherapy can unfortunately have a negative effect on normal cells.[6]

Chemotherapy is the treatment of cancer with an anti neoplastic drug or with a combination of such drugs into a standardized treatment regimen. Chemotherapeutic drugs interfere with cell division in various possible ways, example with the duplication of DNA or the separation of newly formed chromosomes. Most forms of chemotherapy target all rapidly dividing cells and are not specific to cancer cells; although some degree of specificity may come from the inability of many cancer cells to repair DNA damage. The majority of chemotherapeutic drugs can be divided as alkylating agents antimetabolites, anthracyclines, plant alkaloids, topoisomerase inhibitosand other anti tumour agents.[7]

Chemotherapy can cause changes in the mucous membranes resulting in intense pain in the mouth, throat, nasal passages, and gastrointestinal tract, mood disturbances and depression .The most common medications affect mainly the fast-dividing cells of the body, such as blood cells and the cells lining the mouth, stomach, and intestines.Other common side-effects include, depression of the treatment can be physically exhausting for the patient, causing anaemia, tendency to bleed easily, gastrointestinal distress, nausea, and vomiting. This can also produce diarrhoea or constipation. Some medications that kill rapidly dividing cells cause dramatic hair loss.[8]

Complementary medicine is the term used to describe additional forms of treatment that may be given along with chemotherapy. In the past, complementary medicine has claimed various types of “miracle" cures for cancer. Gentle therapies such as massage, relaxation, and other "healing" therapies play a major role in palliative care (symptom relief). Some patients find that complementary medicine, also called as integrative medicine or holistic healing can help alleviate the side effects, pain, and anxiety associated with chemotherapy and cancer treatments in general.[9]

Aroma,the magic of smell has stirred many poets to reach deep in to their vocabulary to capture their essences. Human response to odour is cured in complex setting, by association with emotionally significant

effects. A good part of any person's well being is determined by how he or she responds to the surrounding environment. Smell is the key factor in most forms of human activity. Olfactory distribution between people involves elicitation of attitude and behaviour. The powerful sense of smell and the impact of aromas on physical and psychological stress can be exemplified by the extreme physical reactions such as gagging or heaving which we experience when we come in contact with a particularly offensive smell.[10]

Aromatherapy is a form of complementary therapy that uses volatile plant materials, known as essential oils, and other aromatic compounds for the purpose of altering a person's mind, mood, cognitive function, or health. The theory of this complementary medicine therapy is that the essential oils are absorbed into the body either through the pores of the skin or by inhalation through the nose. These oils are the concentrated essences taken from the flowers, fruit, seeds, leaves and bark of certain plants. There are about 400 essential oils. Holistic aromatherapy uses oils that are thought to have healing properties, but only a small number of these are commonly used in people with cancer. Some of the most popular oils include lavender, rosemary, eucalyptus, camomile, marjoram, jasmine, peppermint, lemon, and geranium. Lavender, a widely cultivated fragrant plant used since antiquity both as a medicine and as a garden ornamental, shows continued value to this day. Geranium essential oil has been used for centuries to reduce depression, reduce anxiety, and promote relaxation.[11]

Aromatherapy is used by patients with cancer primarily as supportive care for general well-being. Safety testing on essential oils has shown minimal adverse effects. Aroma therapists believe that aromatherapy can boost well being, relieve stress, and help to refresh our body. So, it may improve our physical and emotional health. The theory behind aromatherapy is that each essential oil has its own specific health benefits. For example, it is suggested that lavender can help with pain, and may relieve muscle tension and depression. Aromatherapy with the use of healing essential oils, nature's versatile fragrances bring about deep and far-reaching changes in our physical, mental, emotional, and spiritual well-being.[12]

MATERIALS AND METHODS

Research Approach and Design: In this study quasi experimental, pre-test post test control group design was used to accomplish the objectives of the study.

Research Setting: The setting of the study was Vydehi Medical College Hospital at Whitefield, Bangalore. The data was collected from male, and female oncology ward, Day care, GPW, and Clin track.

Population: Male, and female oncology ward, Day care, GPW, and Clin track of Vydehi Medical College Hospital, Whitefield.

Sample and sampling technique: 60 cancer patients receiving chemotherapy in which, 30 patients were selected for the experimental group and another 30 patients in the control group. Nonprobability Purposive sampling technique was used to select the sample.

Data collection instruments: Following tools were used to collect the data a Semi structured self-administered questionnaire consisting of Demographic proforma and Clinical profile. The demographic proforma included age, gender, religion, education, occupation, family income, and type of family. The clinical profile included type of cancer, duration of illness, duration of hospitalization, modality of treatment, duration of treatment and previous knowledge about aromatherapy. Numerical Pain Rating Scale was used to assess the pain. This is standardized tool of 10-point scale. The tool was modified in September 2009. The user had to rate the scale from 0 to 10 or place a mark on a line indicating their level of pain. 0 indicates the absence of pain, while 10 represents the most intense pain possible. The Numerical Rating Pain Scale rated pain as mild, moderate, severe, and worst. Beck Depression Inventory was used to assess the depression. The Beck Depression Inventory is a standardized tool, which assess the level of depression of the selected samples. The tool was developed by Dr Aron Beck in the year 1961.In the present study the researcher used modified Beck Depression Inventory 2010. The tool contained 21 items. Each questionnaire was divided into 4 sets of sub questions. The samples are asked to circle their feelings. Subset "a" gives the score of 0, "b" gives the score of 1, c gives the score of 2 and d gives the score of 4.0ver all the score of BDI is 63. A score ranging 1-10= these ups and downs are considered normal 11-20 = Mild mood disturbances,21-30=Moderate depression31-40 = Severe depression. Over 40 = Extreme depression.

Procedure for data collection: The ethical clearance was obtained from thesis review committee and head of the institution for conducting the study. purpose of the study was explained, and an informed consent was obtained from samples. A pilot study was conducted to ensure the reliability of the tool, applicability of items and identify the obstacles and problems that and problems that may be encountered in data collection, this number were excluded from the studied sample. The samples were selected on the basis of inclusion and exclusion criteria. On day one, 30 samples were selected for the experimental group by purposive sampling technique. Each of the 30 samples were divided in to 3 groups, containing 10 samples each. The selected samples were explained about the study, and the confidentiality of the response was also maintained. Written consent was obtained from samples. Aromatherapy was started for the each experimental group with 20 ml of almond oil mixed with 10 drops of lavender oil and 2 drops of geranium oil for 6 days. The oil was applied to the face, hands, chest, and scalp. On day seven, the post test was assessed. Likewise, each

group was given aromatherapy. After completing the experimental group, 30 samples were selected for the control group. On day one, pre-test score was assessed. On day seven, the post test score was assessed. The data was analysed using descriptive and inferential statistics.

RESULTS AND DISCUSSION

Section 1 (a): Frequency and percentage distribution of subjects according to demographic and clinical variables

The data revealed that under the experimental group, the maximum number 13 (43.33%) of the subjects were between the age group of 31-35 years, and in control group -15(50%) subjects were in the age group of 36 and above. 20 (66.7%) of the subjects were males in the experimental group, 19(63%) of the subjects were males in the control group. The maximum number of subjects in the experimental group who have completed have completed the secondary education was 12(40.0%), and 16(53.33%) of the subjects have completed the secondary education in the control group. The maximum number of subjects 19(63.33%) in both experimental and control group follow Hindu religious customs. In the experimental group 10 samples (33.3%) are coolies, and in the control group, 9 (30%) samples are coolies and self-employed. In the experimental group, 20 (63.33%) are nuclear families, and 17(56.7%) subjects belongs to nuclear families in the control group. Under the experimental group, 16(30%) of the subjects get family income ranging between 2001-6000 and in the control group 17(56.6%) of subjects earn family income ranging between 4001-6000.

The data from the clinical proforma shows most of the subjects in the experimental group, that is, 10(33.3%) and control group that is 9(30%) had oral cancers. The maximum number of subjects in the experimental group that is 14(46.7%) are suffering from cancer for 3-6 months, whereas the majority of subjects in the control group that is 10(33.3%) are suffering from cancer for 6-12 months. Most of the subjects in the experimental group that is 15(50.0%), and in the control group 13(43.3%) were hospitalized for more than 10 days.

Results shows the number of subjects in the experimental group and the control group that is 30(100%) received chemotherapy. Results shows the maximum number of subjects in the experimental group that is 9(96.7%) had no previous knowledge about aromatherapy and 30(100%) of subjects in the control group had no previous knowledge regarding aromatherapy.

Section-I: (b)

Frequency and percentage distribution according to the pre-test and post-test pain score, depression score of subjects in the experimental and the control group.

SL NO	SCORING	PAIN LEVEL	CONTROL GROUP(n=30)				EXPERIMENTAL GROUP(n=30)			
			PRETEST		POSTTEST		PRETEST		POSTTEST	
			f	%	f	%	f	%	f	%
1	1-3	Mild	3	10.0	3	10.0	2	6.3	14	46.7
2	4-6	Moderate	8	26.7	8	26.7	13	21.7	16	53.0
3	7-9	Severe	15	50.0	15	50.0	13	21.7	-	-
4	10	Worst	4	13.3	4	13.3	2	6.3	-	-
		TOTAL	30	100.0	30	100.0	30	100.0	30	100.0

N=60

Table 1 shows that, under the experimental group, in the pre-test, 2 subjects (6.3%) were having mild level of pain, 13subjects (21.7%) had moderate level of pain, 13 subjects (21.7%) belong to severe level of pain, and 2subjects(6.3%) had worst pain. The post-test score showed that 14 subjects (46.7%) were having mild level of pain, 16 subjects (53.0%) had moderate level of pain, and none of the subjects had severe or worst pain.

Under the control group, in the pre-test 3 subjects (10%) were having mild level of pain, 8subjects (26.7%) had moderate level of pain, 15 subjects (50.0%) belong to severe level of pain and 4subjects (13.3%) had worst pain. The post-test score was same as that of pre-test score.

Frequency and percentage distribution of level of depression of patients receiving chemotherapy during pretest and post test N=60

Table 2: Shows that, under the experimental group, in the pre-test 5subjects (16.7%) were having mild level of depression, 7subjects (23.3%) had moderate level of depression, 18 subjects (60.0%) belong to severe level of depression. The post test score showed that 14subjects (46.7%) were having mild level of depression, 16subjects (53.0%) had moderate level of depression, and none of the subjects had extreme level of depression.

SL NO	SCORING	DEPRESSION LEVEL	CONTROL GROUP				EXPERIMENTAL GROUP			
			PRETEST		POSTTEST		PRETEST		POSTTEST	
			f	%	f	%	f	%	f	%
1	11-20	Mild	6	20.0	6	20.0	5	16.7	14	46.7
2	21-30	Moderate	9	30.0	9	30.0	7	23.3	16	53.3
3	31-40	Severe	15	50.0	15	50.0	18	60.0	-	-
4	Over 40	Extreme	0	0.0	0	0.0	0	0.0	-	-
		TOTAL	30	100.0	30	100.0	30	100.0	30	100.0

Under the control group in the pre-test 6 subjects (20%) were having mild level of depression, 9subjects (30%) had moderate level of depression, 15subjects (50.0%) belong to severe level of depression. The post test score was same as that of pre-test score.

Section: II

a) Comparison of post test pain scores of subjects in the experimental and the control group N=60.

SL	GROUP	N	MEAN	SD	MD	t value	LEVEL OF SIGNIFICNCE
01	EXPERIMENTAL GROUP	30	5.13	2.17	1.53	6.02*	0.05
02	CONTROL GROUP	30	3.6	1.67			

Significant at 0.05 level t (0.05, df 58) =2.0

The table 3, presents the post- test pain scores of both the experimental and the control group .There is a significant reduction in the level of pain at 0.05 Level of significance with unpaired t-test value of 6.02 with degree of freedom 58.

b) Comparison of post-test pain score and pre-test pain score of subjects in the experimental group.

SL	TEST	Mean	SD	t value	LEVEL OF SIGNIFICANCE
01	Pre test	63.0	20.2	11.93*	0.05
	Post test	36.0	16.7		

*Significant at 0.05 level t(0.05,df29)=2.045

The table 4 revealed that during the pre-test, in the experimental group, the mean value is 63.0 and S.D is 20.2, and in the post –test, the mean value is 36.0 and S.D is 16.7.The pre-test and the post-test scores shows that there is a significant reduction of pain at 0.05 Level of significance in the experimental group with paired t-test value of 11.93 with the degree of freedom 29

c) Comparison of post-test depression scores of subjects in the experimental and control group N=60.

SL	GROUP	N	MEAN	SD	MD	t value	LEVEL OF SIGNIFICNCE
01	EPERIMENTAL GROUP	30	22.6	8.08	5.7	3.19*	0.05
02	CONTROL GROUP	30	28.3	8.88			

*Significant at 0.05 level t(0.05,df 58)=2.0

The table 5, presents the post- test depression scores of both the experimental and the control group .There is a significant reduction with level of depression at 0.05 Level of significance with unpaired t-test value of 3.19 with degree of freedom 58.

d) Comparison of post-test depression score and pre-test depression score of subjects in the experimental group.

SL	Test	Mean	SD	t value	LEVEL OF SIGNIFICANCE
01	Pre test	47.2	11.5	8.05*	0.05
	Post test	35.0	12.8		

N=30 *Significant at 0.05 level t(0.05,df 29)=2.045

The table 6 reveals that during the pre-test in the experimental group, the mean value is 47.2 and S.D is 11.5, and in the pos –test, the mean value is 35.0 and S.D is 12.8. The pre-test and the post-test scores shows that there is a significant reduction of depression at 0.05 Level of significance in the experimental group with paired t-test value of 8.05 with the degree of freedom 29.

Section: III (a): Association between pain and selected demographic variables using chi-square-Yates correction N=60
***SIGNIFICANT AT 0.05 LEVEL**
The results shows that the selected demographic variables such as gender, religion, type of family have significance association with the pain scores of the experimental group and other variables have no association with pain.

(b) Association between depression and selected demographic variables using chi-square-Yates correction N=60
***SIGNIFICANT AT 0.05 LEVEL**
Results shows that the selected demographic variables such as gender, education, type of family have significance association with the depression scores of experimental group and other variables have no association with depression.

DISCUSSION
In order to achieve the objectives of the study in this study quasi experimental, pre-test post test control group design was used. Nonprobability Purposive sampling technique was used to select the sample. The aim of the study was to evaluate the effectiveness of aromatherapy on pain and depression among patients receiving chemotherapy in the selected hospital in Bangalore. Data collection and analysis were carried out based on the objectives of the study.

Organization of Results: The results of the study are presented in the following sections:
Section I: Findings related to selected demographic and clinical variables
Section II: Findings related to objectives of the study
Section III: Findings related to hypothesis of the study

Section i: findings related to selected demographic and clinical variables.
In the present study, 25subjects (41.7 %) were in the age group of 36 and above, 23 subjects (38.3 %) were in age group of 31- 35 and 12 of them (20%) belonged to the age group of 26-30. In the present study, a majority of 39subjects (65.0%) were males and 21 subjects (35.0%) were females. Among the subjects, 28(46.7%) of them completed primary education, 22 of them (36.6%) completed secondary education and 10 subjects (16.7%) completed higher secondary education. Among them, 38 (63.3 %) followed the Hindu religion, and most of the subjects 37(61.7%) belong to nuclear families. In the present study, about18 (30 %) of them worked as coolies, and majority of them were having a family income between 1001-4000. The study findings also showed that the 19 (37.7 %) were suffering from oral cancer and 9(15%) were diagnosed with breast cancer. A similar study conducted showed that most of the subjects (58%) had breast cancer. In the present study, among the cancer patients, almost 23 (38.3%) of them were having the duration of illness from 3-6 months. A similar study also concluded that most of the samples were suffering from the illness for more than 3 months.[25] The current study showed that almost 28 (46.7%) of the subjects were hospitalized for more than 10 days. The modality of treatment revealed that 60(100%) were treated using chemotherapy. A similar study also concluded that most of the patients diagnosed with cancer were treated with chemotherapy.

Section II: Findings Related To Objectives of The Study
Objective I: To assess the level of pain among patients receiving chemotherapy
In the present study, pain level of patients receiving chemotherapy was assessed before giving aromatherapy intervention using Numerical Pain Rating Scale. According to Numerical Pain Rating Scale, 6(10%) were having worst pain, 28 (46.6%) were having severe pain, 21(35%) had moderate pain, and 5(8.33%) were having mild pain. A similar finding was concluded that pain is the most common side effect of chemotherapy.[13]

Objective II: To assess the level of depression among patients receiving chemotherapy
In the present study, depression was also assessed, using Beck Depression Inventory, the pre assessment showed that 33(55%) of them were having severe depression, 16 (26.6%) of them were having moderate depression, and 11(18.33%) were having mild depression and none of them had extreme depression. A similar finding found in the study was that 58% of the cancer patients were having depression.[14]

Objective III: To assess the effectiveness of Aromatherapy on pain and depression among patients receiving chemotherapy
In the present study, it was found that there is a reduction in the level of pain between the pre-test (63.0) and post-test (36.0) assessment using Numerical Pain Rating Scale in the experimental group and was found to be statistically significant with $t=11.93$, $P<0.05$). Whereas the control group was not having any significant change in terms of pain. This finding was also supported by a similar study, which showed statistically significant changes following aromatherapy, where there was an overall 60% reduction of pain in the experimental group.[15]

In the present study, it was found that there is a significant decrease in the level of depression pre-test (47.2) and post-test (35.0) assessment (t=8.05, P 0.05) using Beck Depression Inventory in the experimental

group. Similar findings were found in the study conducted in the palliative care U.K, where there was a statistically significant decrease in depression (77%)

Objective IV: To find the association between the level of pain among patients receiving chemotherapy
An association between the study findings and the selected demographic and clinical variables with change in scores of pains using Numerical Pain Rating Scale. It showed that there was a significant association between gender (6.70), religion (7.82), type of family (4.29) and level of pain in the experimental group. There was no association between age, education, family income, type of cancer, duration of illness, and duration of hospitalization with level of pain in the experimental group.

Objective V: To find the association between the level of depression among patients receiving chemotherapy
An association between the study findings and the selected demographic and clinical variables with change of scores of depression using Beck Depression Inventory. It showed that there was significant association between gender (6.70), education (7.23), type of family (4.29), There was no association between other variables such as age, religion, family income, type of cancer, duration of illness, and duration of hospitalization in the experimental group. The Chi-Square tests- Yates correction was used to find the association between the post test scores of the experimental group with the selected demographic and clinical variables.

Section III: Findings Related To Hypothesis Of The Study
$H_{1:}$ There is a significant difference between pre-test and post-test pain score following aromatherapy among patients receiving chemotherapy in the experimental group. The present study findings concluded that there is a significant difference in the pre-test and post-test pain score following aromatherapy among patients receiving chemotherapy in the experimental group. Hence, hypothesis H_1 is accepted.

H_2: There is a significant difference between the post-test pain scores of the experimental and the control group among patients receiving chemotherapy.

The present study findings concluded that there is a significant difference between the post test pain scores of experimental group with a mean of 5.13 and control group with a mean of 3.6, with $t_{(58)=}6.02$ among patients receiving chemotherapy. Hence, hypothesis H_2 is accepted.

$H_{3:}$ There is a significant difference between pre- test and post- test depression score following aromatherapy among patients receiving chemotherapy in the experimental group.

The present study findings concluded that there is there is a significant difference in the pre-test and post-test depression score following aromatherapy among patients receiving chemotherapy in the experimental group. Hence the hypothesis H_3 is accepted.

H_4: There is a significant difference between the post-test depression scores of the experimental and control group among patients receiving chemotherapy.

The present study findings concluded that there is significant difference between the post test depression scores of experimental group with a mean of 22.6 and control group with a mean of 28.3, with $t_{(58)=}3.19$ among patients receiving chemotherapy. Hence, hypothesis H_4 is accepted.

$H_{5:}$ There is a significant association between pain, depression and selected demographic variables such as age, gender, education, occupation, type of family, family income, type of cancer, duration of illness, and hospitalization

An association between the study findings and the selected demographic and clinical variables with change in scores of pain using Numerical Pain Rating Scale. It showed that there was a significant association between gender (6.70), religion (7.82), type of family (4.29), and level of pain.

An association between the study findings and selected demographic and clinical variables with change of scores of depressions using Beck Depression Inventory. It showed that there is significant association between gender (6.70), education (7.23), type of family (4.29). Hence, hypothesis H_5 is accepted.

CHAPTER II
OBJECTIVES
This chapter deals with the statement of problems, objectives of the study, operational definitions, assumptions, limitations, and hypothesis.

Statement Of Problem
Effectiveness of Aromatherapy on Pain and Depression among patients receiving chemotherapy in a selected hospital, Bangalore.

Objectives
1. To assess the level of pain among patients receiving chemotherapy as measured by Numerical Pain Rating Scale.
2. To assess the level of depression among patients receiving chemotherapy as measured by Beck Depression Inventory.
3. To evaluate the effectiveness of aromatherapy on pain and depression among patients receiving chemotherapy.
4. To find the association between the findings and selected demographic variables.

Operational Definitions

1) Effectiveness

In this study, it refers to the difference between the pre-test and post test score among patients receiving chemotherapy of the experimental group on the level of pain and depression after aromatherapy, which is measured by Numerical Pain Rating Scale (Updated September 2009) and Beck Depression Inventory (Dr Aaron Beck) (Modified 2010)

2) Aromatherapy

In this study it refers to application of 10 drops of lavender oil and 1-2 drops of geranium oil, diluted in 20 ml of almond oil which is applied on the upper body parts such as chest, neck hands., face, back and scalp of the patients receiving cancer chemotherapy to reduce pain and depression.

3) Patient

In this study it refers to the client who is admitted in the oncology wards and day care unit to receive chemotherapy as a treatment for cancer.

4) Pain

In this study it is the unpleasant sensory experience felt by the patients on chemotherapy as measured by Numerical Pain Rating Scale. (Updated September 2009).

5) Depression

In this study it refers to excessive sadness and hopelessness experienced by the patients receiving chemotherapy as measured by Beck Depression Inventory (Dr Aaron Beck) (Modified 2010)

Assumptions

- Patients receiving chemotherapy may have pain and depression.
- Aromatherapy may reduce pain and depression among patients receiving chemotherapy.

Delimitation of the Study

- The study was limited to 60 samples
- The study was limited to patients receiving chemotherapy
- Only inpatients were selected
- The study was limited to a selected hospital

Hypothesis

1. **H_1:** There is a significant difference between the pre-test and post test pain score following aromatherapy, among patients receiving chemotherapy in the experimental group.
2. **H_2 :**. There is a significant difference between the post- test pain scores of experimental and control group, among patients receiving chemotherapy.
3. **H_3:** There is a significant difference between pre test and post test depression score following aromatherapy among patients receiving chemotherapy in the experimental group.
4. **H_4:** There is a significant difference between the post test depression scores of the experimental and control group, among patients receiving chemotherapy.
5. **H_5:** There is a significant association between pain, depression and selected demographic variables such as age, gender, education, occupation, type of family, family income, type of cancer, duration of illness and hospitalization.

Technique of Data Collection

Following the ethical committees permission, data gathering was accomplished using semi structured self-administered questionnaire for demographic variables and clinical profile of the selected patients, Numerical Pain Rating Scale(September 2009) and Beck Depression Inventory (Dr Aron Beck 2010) were used for assessing pain and depression, respectively.

A. Development of The Tool

Following tools were used to collect the data

- ❖ TOOL I: Semi structured self administered questionnaire
  - Section A-Demographic proforma
  - Section B-Clinical profile
- ❖ TOOL II: Numerical Pain Rating Scale(September 2009)
- ❖ TOOL III: Beck Depression Inventory(Dr Aron Beck 2010)

Contents of the tool

1) TOOL - I : Semi Structured Self Administered Questionnaire

Section –A: Demographic Variables

Demographic variables of the selected patients were collected by semi- structured self -administered questionnaire. The demographic proforma included age, gender, religion, education, occupation, family income, and type of family. Pretesting of the tool found that the samples were able to read, understand and give appropriate answers to the questions. The time taken by each sample to complete the section was 5 minutes. The validity of the tool was done by 3 nursing experts and the corrections were made as per their suggestions.

Section –B: Clinical Variables

The clinical profile included type of cancer, duration of illness, duration of hospitalization, modality of treatment, duration of treatment and previous knowledge about aromatherapy. Pretesting of the tool found that the samples were able to read, understand and give appropriate answers to the questions. The time taken by each sample to complete the section was 5 minutes.

2) TOOL II: Numerical Pain Rating Scale[September 2009]

This section rates the pain of the selected samples. This is standardized tool of 10 point scale. The tool was modified on September 2009. The user had to rate the scale from 0 to 10 or place a mark on a line indicating

their level of pain. 0 indicates the absence of pain, while 10 represents the most intense pain possible. The Numerical Rating Pain Scale allows the researcher to rate pain as mild, moderate, severe, and worst; which can indicate a potential disability level. Pretesting of the tool found that the samples were able to read, understand, and rate their pain by placing a mark on the line. The time taken by each sample to complete the section was 2 minutes. Reliability of the tool was done by Rater-Inter Rater method and score was 0.8, which proved the tool is reliable.

3) SECTION III: Beck Depression Inventory[Dr Aron Beck 2010]

The Beck Depression Inventory is a standardized tool, which assess the level of depression of the selected samples. The tool was developed by Dr Aron Beck in the year 1961.In the present study the researcher used modified Beck Depression Inventory 2010. The tool contained 21 items. Each questionnaire was divided into 4 sets of sub questions. The samples are asked to circle their feelings. Subset "a" gives the score of 0, "b" gives the score of 1,c gives the score of 2 and d gives the score of 4.0ver all the score of BDI is 63. A score ranging 1-10= these ups and downs are considered normal 11-20 = Mild mood disturbances, 21-30 = Moderate depression31-40 = Severe depression. Over 40 = Extreme depression. Pretesting of the tool found that the samples were able to read, understand, and were able to circle their feelings beside the question. The time taken by each sample to complete the section was 8 minutes.

Reliability of the tool was done by split half method and score was 0.8 which proved the tool is reliable.

- **Establishment of Content Validity of the Tool**

The prepared data collection tool, along with the problem statement, objectives, operational definitions, criteria checklist, and lesson plan were submitted to experts. The experts were requested to give their opinions with suggestions regarding the relevancy, appropriateness, and adequacy of the tool. Finally the modified version of the tool was used for data collection. [ANNEXURE-V]

Ethical Considerations

1. Permission was obtained from the ethical committee of Vydehi Institute of Nursing Sciences and Research Centre.[ANNEXURE-III]
2. Permission was obtained from the Head Of the department of Oncology, VIMS and RC.[ANNEXURE-I]
3. A written consent form was obtained individually from all subjects who participated in the study.[ANNEXURE-VII]
4. The subjects were informed that their participation was voluntary and they had the freedom to drop out from the study when they liked to do so.
5. Confidentiality of the sample was maintained.

Pilot Study

The pilot study was conducted on 12 patients in the oncology wards from 17/10/2012 to 28/10/2012. Permission was obtained from the Head of the institution and the Head of the Department of Oncology [ANNEXURE-II]. The pilot study was decided to be conducted on 12 samples receiving chemotherapy in the oncology wards of the selected hospital. 6 samples were selected for the experimental group and another 6 samples were selected for the control group by purposive sampling technique. Permission was obtained from the Head of the institution and the Head of the Department of Oncology. On day one the pre-test score of pain and depression was assessed by NRS and BDI, respectively. Aromatherapy was started for the experimental group with 20ml of almond oil mixed with 10 drops of lavender oil and 2 drops of geranium oil. The oil was applied on the face, hands, chest, and scalp. On day 7, post test score was assessed. The control group was selected on 8^{th} day and the pre test score was done. On 7^{th} day post test score was assessed. The difference in pre-test and post-test score of both the groups showed there is significant difference in pain and depression with and without aromatherapy.

The pilot study confirmed the feasibility of the intended study.

Data Collection Process

The formal written permission for data collection was obtained from the Head of the institution and HOD of the oncology department. Data collection period extended from 01/11/2012 to 12/12/2012. The samples were selected on the basis of inclusion and exclusion criteria. On day one, 30 samples were selected for the experimental group by purposive sampling technique. Each of the 30 samples were divided in to 3 groups, containing 10 samples each. The selected samples were explained about the study, and the confidentiality of the response was also maintained. Written consent was obtained from samples. Aromatherapy was started for the each experimental group with 20 ml of almond oil mixed with 10 drops of lavender oil and 2 drops of geranium oil for 6 days. The oil was applied to the face, hands, chest, and scalp. On day seven, the post test was assessed. Likewise, each group was given aromatherapy. After completing the experimental group, 30 samples were selected for the control group. On day one, pre-test score was assessed. On day seven, the post test score was assessed.

Plan for data Analysis

Data was planned on the basis of objectives and hypothesis in terms of descriptive and inferential statistics.

Descriptive statistics

The demographic data and the clinical profile were analyzed using frequencies and percentages.

Inferential statistics

- "t test" was used to find significant difference between the pain and aromatherapy of experimental and control group.
- Chi square test was used to find the association between the findings and selected demographic variables.

RESULTS

This chapter deals with the analysis of data collected from 60 samples receiving chemotherapy. A semi-structured self-administered questionnaire, Numerical Pain Rating Scale and Beck Depression Inventory was used for data collection. Data collected from samples was analysed by using descriptive and inferential statistics based on the objectives of the study.

Objectives of the study were to

1. Assess the level of pain among patients receiving chemotherapy, as measured by Numerical Pain Rating Scale.
2. Assess the level of depression among patients receiving chemotherapy, as measured by Beck Depression Inventory.
3. Evaluate the effectiveness of aromatherapy on pain and depression among patients receiving chemotherapy.
4. Find the association between the findings and selected demographic variables.

ORGANIZATION OF RESULTS

The results of the study are presented in the following sections:

Section I

a) Frequency and percentage distribution of subjects according to demographic and clinical variables.

b) Frequency and percentage distribution according to the pre-test and post- test pain score, depression score of subjects in the experimental and the control group.

Section II

a) Comparison of post-test pain score and pre-test pain score of subjects in the experimental and the control group.

b) Comparison of post-test pain scores of subjects in the experimental and the control group.

c) Comparison of post-test depression score and pre-test depression score of subjects in the experimental and the control group.

d) Comparison of post -test depression scores of subjects in the experimental and the control group.

Section III

a) Association between pain and selected demographic variables such as age, gender, education, type of family, income, type of cancer, duration of illness, and duration of hospitalization.

b) Association between depression and selected demographic variables such as age, gender, education, type of family, income, type of cancer, duration of illness, and duration of hospitalization.

Section I (a) Frequency and Percentage Distribution of Subjects According To Demographic And Clinical Variables

Table 5.1: Distribution of Demographic Variables of the experimental and the control Group N=60.

SL	VARIABLES	CATEGORY	SAMPLES					
			Control (n=30)		Experimental (n=30)		Combined (N=60)	
			F	%	f	%	F	%
1	Age Group (years)	26-30	5	16.7	7	23.3	12	20.0
		31-35	10	33.3	13	43.4	23	38.3
		36+	15	50.0	10	33.3	25	41.7
2	Gender	Male	19	63.3	20	66.7	39	65.0
		Female	11	36.7	10	33.3	21	35.0
3	Education	Primary	16	53.3	12	40.0	28	46.7
		Secondary	10	33.4	12	40.0	22	36.7
		Higher secondary	4	13.3	6	20.0	10	16.7
4	Religion	Hindu	19	63.3	19	63.3	38	63.3
		Christian	1	3.3	2	6.7	3	5.0
		Muslim	10	33.4	9	30.0	19	31.7
5	Occupation	Unemployed	9	30.0	8	26.7	17	28.3
		Coolie	8	26.7	10	33.3	18	30.0
		Government	4	13.3	3	10.0	7	11.7
		Self employed	9	30.0	9	30.0	18	30.0
6	Type of Family	Nuclear	17	56.7	20	66.7	37	61.7
		Joint	13	43.3	10	33.3	23	38.3
7	Family Income/month	Rs.1,001-4,000	17	56.7	16	53.3	33	55.0
		Rs.4,001-6,000	13	43.3	14	46.7	27	45.0

Table 5.1 shows the frequency and percentage distribution demographic of variable of the sample according to the age, gender, education, religion, occupation, type of family, and family income.

The data presented in the table reveals that under the experimental group, the maximum number 13 (43.33%) of the subjects were between the age group of 31-35 years, and in control group -15(50%) subjects were in the age group of 36 and above. 20 (66.7%) of the subjects were males in the experimental group, 19(63%) of the subjects were males in the control group. The maximum number of subjects in the experimental group who have completed have completed the secondary education was 12(40.0%), and 16(53.33%) of the subjects have completed the secondary education in the control group. The maximum number of subjects 19(63.33%) in both experimental and control group follow Hindu religious customs. In the experimental group 10 samples (33.3%) are coolies, and in the control group, 9 (30%) samples are coolies and self-employed. In the experimental group, 20 (63.33%) are nuclear families, and 17(56.7%) subjects belongs to nuclear families in the control group. Under the experimental group, 16(30%) of the subjects get family income ranging between 2001-6000 and in the control group 17(56.6%) of subjects earn family income ranging between 4001-6000.

Distribution of Clinical Variables of Experimental and Control Group

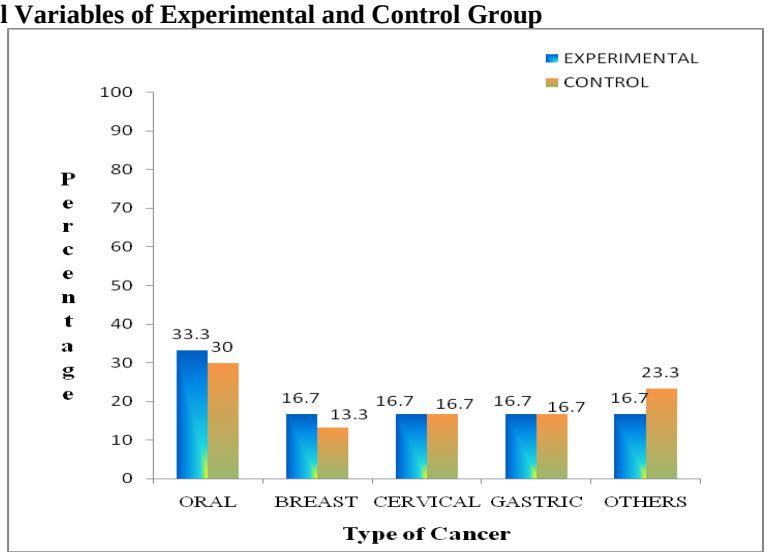

Figure 5.1: Bar diagram representing percentage distribution of samples according to the type of cancer.

Figure 5.1 shows, most of the subjects in the experimental group, that is, 10(33.3%) and control group that is 9(30%) had oral cancers.

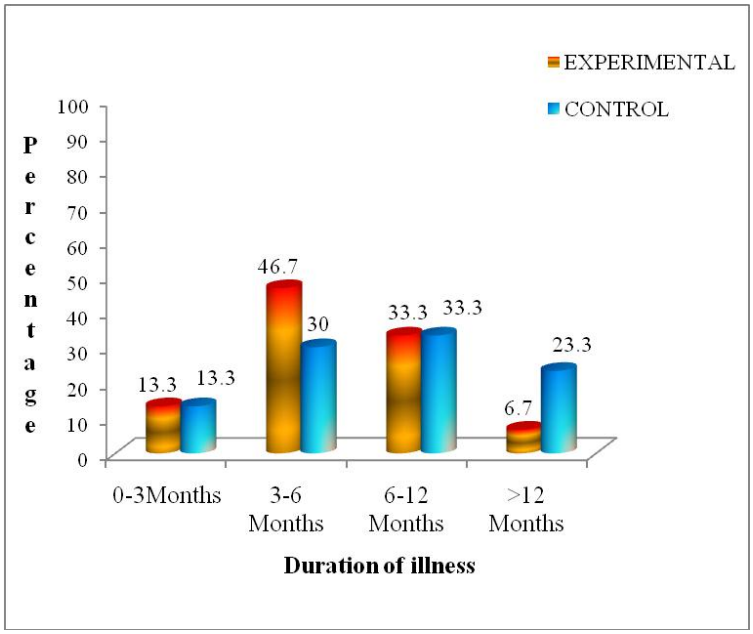

Figure 5.2: Cylindrical diagram showing percentage distribution of samples according to the duration of illness

Figure 5.2 shows the maximum number of subjects in the experimental group that is 14(46.7%) are suffering from cancer for 3-6 months, whereas the majority of subjects in the control group that is 10(33.3%) are suffering from cancer since 6-12 months.

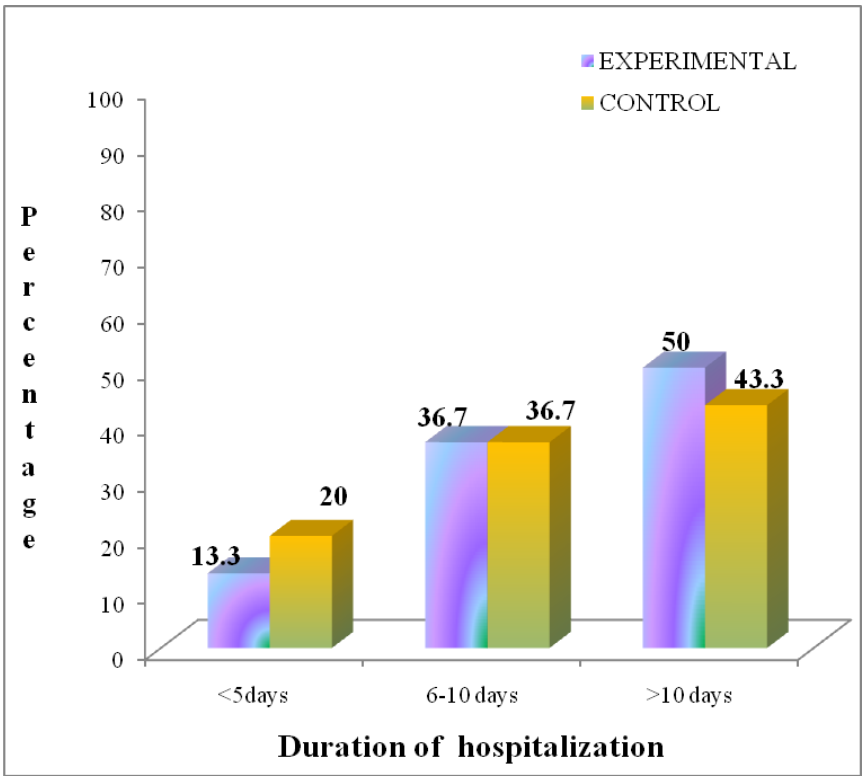

Figure 5.3: Bar diagram representing percentage distribution of samples according to duration of hospitalization.

Figure 5.3 shows that most of the subjects in the experimental group that is 15(50.0%), and in the control group 13(43.3%) were hospitalized for more than 10 days.

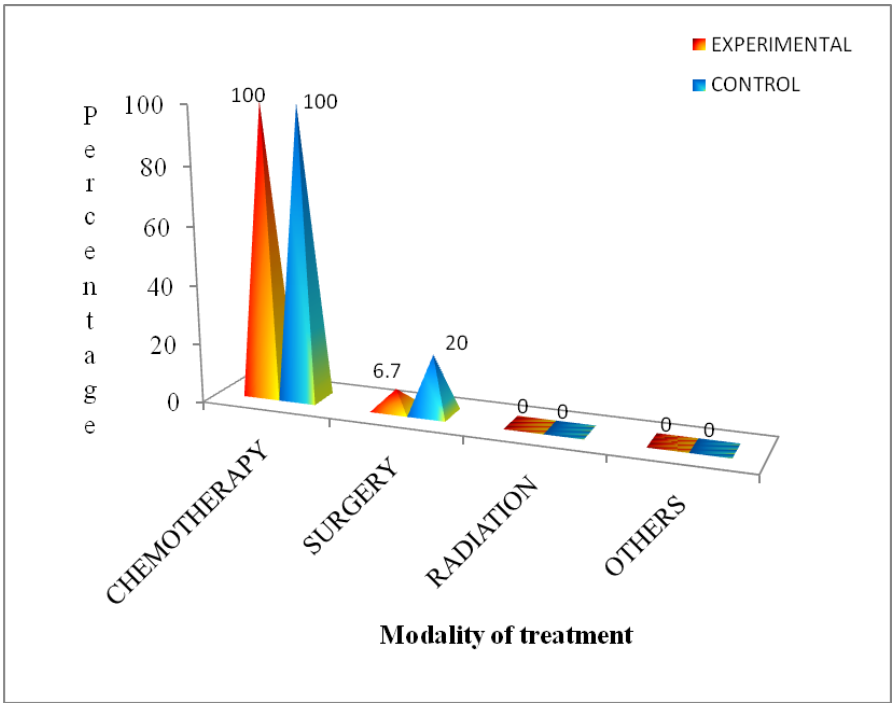

Figure 5.4: Cone diagram representing percentage distribution of samples according to the modality of treatment.

Figure 5.4 shows the number of subjects in the experimental group and the control group that is 30(100%) received chemotherapy.

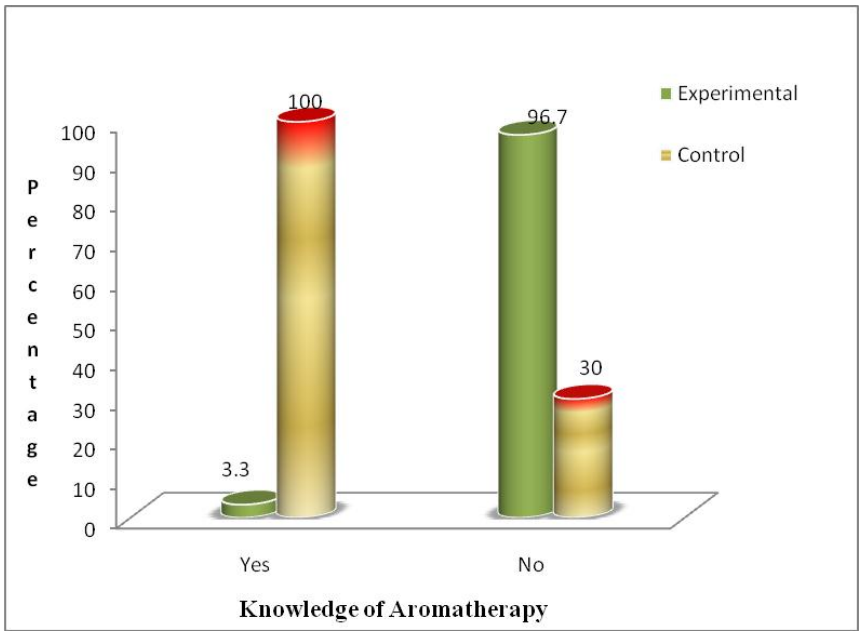

Figure 5.5: Cylindrical diagram Percentage distribution of samples according to the previous knowledge of aromatherapy.

Figure 5.5 shows the maximum number of subjects in the experimental group that is 9(96.7%) had no previous knowledge about aromatherapy and 30(100%) of subjects in the control group had no previous knowledge regarding aromatherapy.

SECTION-I: (b)

Frequency and Percentage Distribution According To The Pre-Test And Post-Test Pain Score, Depression Score Of Subjects In The Experimental And The Control Group

Table 5.2: Frequency and percentage of selected patients of experimental and control group according to their pre-test and post-test pain level N=60.

SL NO	SCORING	PAIN LEVEL	CONTROL GROUP(n=30)				EXPERIMENTAL GROUP(n=30)			
			PRETEST		POSTTEST		PRETEST		POSTTEST	
			F	%	f	%	f	%	f	%
1	1-3	Mild	3	10.0	3	10.0	2	6.3	14	46.7
2	4-6	Moderate	8	26.7	8	26.7	13	21.7	16	53.0
3	7-9	Severe	15	50.0	15	50.0	13	21.7	-	-
4	10	Worst	4	13.3	4	13.3	2	6.3	-	-
		TOTAL	30	100.0	30	100.0	30	100.0	30	100.0

Table 5.2 shows that, under the experimental group, in the pre-test, 2 subjects (6.3%) were having mild level of pain, 13subjects (21.7%) had moderate level of pain, 13 subjects (21.7%) belong to severe level of pain, and 2subjects(6.3%) had worst pain. The post-test score showed that 14 subjects (46.7%) were having mild level of pain, 16 subjects (53.0%) had moderate level of pain, and none of the subjects had severe or worst pain.

Under the control group, in the pre-test 3 subjects (10%) were having mild level of pain, 8subjects (26.7%) had moderate level of pain, 15 subjects (50.0%) belong to severe level of pain and 4subjects (13.3%) had worst pain. The post-test score was same as that of pre-test score.

Distribution of Level of Depression of Patients Receiving Chemotherapy During Pre Test And Post Test

Table 5.3: Frequency and percentage of selected patients of experimental and control group according to their pre-test and post-test depression level.

SL NO	SCORING	DEPRESSION LEVEL	CONTROL GROUP				EXPERIMENTAL GROUP			
			PRETEST		POSTTEST		PRETEST		POSTTEST	
			F	%	f	%	f	%	f	%
1	11-20	Mild	6	20.0	6	20.0	5	16.7	14	46.7
2	21-30	Moderate	9	30.0	9	30.0	7	23.3	16	53.3
3	31-40	Severe	15	50.0	15	50.0	18	60.0	-	-
4	Over 40	Extreme	0	0.0	0	0.0	0	0.0	-	-
		TOTAL	30	100.0	30	100.0	30	100.0	30	100.0

N=60

Table 5.3 shows that, under the experimental group, in the pre-test 5subjects (16.7%) were having mild level of Depression, 7subjects (23.3%) had moderate level of depression, 18 subjects (60.0%) belong to severe level of depression. The post test score showed that 14subjects (46.7%) were having mild level of depression, 16subjects (53.0%) had moderate level of depression, and none of the subjects had extreme level of depression.

Under the control group in the pre-test 6 subjects (20%) were having mild level of depression, 9subjects (30%) had moderate level of depression, 15subjects (50.0%) belong to severe level of depression. The post test score was same as that of pre-test score.

SECTION: II

a) Comparison Of Post Test Pain Scores Of Subjects In The Experimental And The Control Group

Table 5.4: Comparison of Mean, Standard deviation, and t test value between the post-test score of the experimental and Control group N=60.

SL	GROUP	N	MEAN	SD	MD	t value	LEVEL OF SIGNIFICNCE
01	EXPERIMENTAL GROUP	30	5.13	2.17	1.53	6.02*	0.05
02	CONTROL GROUP	30	3.6	1.67			

Significant at 0.05 level t (0.05, df 58) =2.0

The table 5.4, presents the post- test pain scores of both the experimental and the control group .There is a significant reduction in the level of pain at 0.05 Level of significance with unpaired t-test value of 6.02 with degree of freedom 58.

b) Comparison Of Post-Test Pain Score And Pre-Test Pain Score Of Subjects In The Experimental Group

Table 5.5: Comparison of mean, standard deviation, and t- test value of the pre and post test score of pain in the experimental group.

SL	TEST	Mean	SD	t value	LEVEL OF SIGNIFICANCE
01	Pre test	63.0	20.2	11.93*	0.05
	Post test	36.0	16.7		

*Significant at 0.05 level t(0.05,df29)=2.045

The table 5.5 revealed that during the pre-test, in the experimental group, the mean value is 63.0 and S.D is 20.2, and in the post –test, the mean value is 36.0 and S.D is 16.7.The pre-test and the post-test scores shows that there is a significant reduction of pain at 0.05 Level of significance in the experimental group with paired t-test value of 11.93 with the degree of freedom 29.

c) Comparison Of Post-Test Depression Scores Of Subjects In The Experimental And Control Group

Table 5.6: Mean, Standard deviation, and t test value of the experimental and control group N=60.

SL	GROUP	N	MEAN	SD	MD	t value	LEVEL OF SIGNIFICNCE
01	EPERIMENTAL GROUP	30	22.6	8.08	5.7	3.19*	0.05
02	CONTROL GROUP	30	28.3	8.88			

*Significant at 0.05 level t(0.05,df 58)=2.0

The table 5.6, presents the post- test depression scores of both the experimental and the control group .There is a

significant reduction with level of depression at 0.05 Level of significance with unpaired t-test value of 3.19 with degree of freedom 58.

d) Comparison Of Post-Test Depression Score And Pre-Test Depression Score Of Subjects In The Experimental Group

Table 5.7: Comparison of mean, standard deviation, and t- test value of the pre and post-test score of depression in the experimental group. N=30.

SL	Test	Mean	SD	t value	LEVEL OF SIGNIFICANCE
01	Pre test	47.2	11.5	8.05*	0.05
	Post test	35.0	12.8		

*Significant at 0.05 level t(0.05,df 29)=2.045

The table 5.7 reveals that during the pre-test in the experimental group, the mean value is 47.2 and S.D is 11.5, and in the pos –test, the mean value is 35.0 and S.D is 12.8. The pre-test and the post-test scores shows that there is a significant reduction of depression at 0.05 Level of significance in the experimental group with paired t-test value of 8.05 with the degree of freedom 29.

SECTION: III(a)

Table 5.8: Association between pain and selected demographic variables using chi-square-Yates correction N=60.

SL	Demographic Variables	Category	N	Respondents Depression				χ^2 Value	Significance
				Mild		Moderate			
				f	%	f	%		
1	Age Group (years)	26-30	7	4	57.1	3	42.9	0.71	Non significant
		31-35	13	5	38.5	8	61.5		
		36+	10	5	50.0	5	50.0		
2	Gender	Male	20	6	30.0	14	70.0	6.70*	Significant
		Female	10	8	80.0	2	20.0		
3	Education	Primary	12	6	50.0	6	50.0	0.54	Significant
		Secondary &above	18	8	50.0	10	50.0		
4	Religion	Hindu	19	11	57.9	8	40.0	7.82*	Significant
		Others	10	2	20.0	8	80.0		
5	Type of family	Nuclear	20	12	60.0	8	40.0	4.29*	Significant
		Joint	10	2	20.0	8	80.0		
6	Family income	Rs.1,001-4,000	16	8	50.0	8	50.0	0.15	Non significant
		Rs.4,001-6,000	14	6	42.9	8	57.1		
7	Type of cancer	Oral & breast	15	5	40.0	8	60.0	0.67	Non significant
		Others	15	7	50.0	17	50.0		
8	Duration of Illness in months	0-3 months	4	1	25.0	3	75.0	3.28	Non significant
		3months &more	26	13	50.0.	13	50.0		
9	Duration of hospitalizatin	<5 days	4	2	50.0	2	50.0	0.56	Non significant
		>6 days	26	12	46.5	14	53.8		

***Significant At 0.05 Level**

The table 5.8 shows that the selected demographic variables such as gender, religion, type of family have significance association with the pain scores of the experimental group and other variables have no association with pain.

Table 5.9: Association between depression and selected demographic variables using chi-square-Yates correction N=60.

SL	Demographic variables	Category	N	Respondents Depression				χ^2 Value	Significance
				Mild		Moderate			
				N	%	N	%		
1	Age Group (years)	26-30	7	5	71.4	2	28.6	3.09	Non significant
		31-35	13	4	30.8	9	69.2		
		36+	10	5	50.0	5	50.0		
2	Gender	Male	20	6	30.0	14	70.0	6.70*	significant
		Female	10	8	80.0	2	20.0		

3	Education	Primary	12	8	66.7	4	33.3	7.23*	significant
		Secondary &above	18	6	50.0	12	50.0		
4	Religion	Hindu	19	9	47.4	10	52.6	2.93	Non significant
		Others	11	5	100	6	66.7		
5	Type of family	Nuclear	20	12	60.0	8	40.0	4.29*	significant
		Joint	10	2	20.0	8	80.0		
6	Family income	Rs.1,001-4,000	16	11	68.7	5	31.3	6.72	Non significant
		Rs.4,001-6,000	14	3	21.4	11	78.6		
7	Type of cancer	Oral & breast	10	6	60.0	4	40.0	9.11	Non significant
		Others	20	8	50.0	17	50.0		
8	Duration of Illness in months	0-3 months	18	10	55.5	8	45.0	2.48	Non
		3months &more	12	4	33.3	8	66.6		
9	Duration of hospitalization	<5 days	4	2	s50.0	2	50.0	2.36	Non significant
		>6 days	26	12	50.0	14	50		

*SIGNIFICANT AT 0.05 LEVEL

The table 5.9 shows that the selected demographic variables such as gender, education, type of family have significance association with the depression scores of experimental group and other variables have no association with depression.

CHAPTER VI
DISCUSSION

This chapter deals presents the findings of the study, which is described in objectives, hypothesis of the study, and in relation with the findings of the other study.

The aim of the study is to evaluate the effectiveness of aromatherapy on pain and depression among patients receiving chemotherapy in the selected hospital in Bangalore. Data collection and analysis were carried out based on the objectives of the study.

OBJECTIVES

1. To assess the level of pain among patients receiving chemotherapy as measured by Numerical Pain Rating Scale.
2. To assess the level of depression among patients receiving chemotherapy as measured by Beck Depression Inventory.
3. To evaluate the effectiveness of aromatherapy on pain and depression among patients receiving chemotherapy.
4. To find the association between the findings and the selected demographic variables.

Hypothesis

1. **H_1:** There is a significant difference between pre-test and post-test pain score following aromatherapy among patients receiving chemotherapy in the experimental group.
2. **H_2:** There is a significant difference between the post test pain scores of experimental and control group among patients receiving chemotherapy
3. **H_3:** There is a significant difference between pre test and post test depression score following aromatherapy among patients receiving chemotherapy in the experimental group.
4. **H_4:** There is a significant difference between the post test depression scores of the experimental and control group among patients receiving chemotherapy.
5. **H_5:** There is a significant association between pain, depression and selected demographic variables such as age, gender, education, occupation, type of family, family income, type of cancer ,duration of illness and hospitalization

ORGANIZATION OF RESULTS

The results of the study are presented in the following sections:
Section I: Findings related to selected demographic and clinical variables
Section II: Findings related to objectives of the study
Section III: Findings related to hypothesis of the study

Section i: Findings related to selected demographic and clinical variables

In the present study, 25subjects (41.7 %) were in the age group of 36 and above, 23 subjects (38.3%) were in age group of 31- 35 and 12 of them (20%) belonged to the age group of 26-30. In the present study, a majority of 39subjects (65.0%) were males and 21 subjects (35.0%) were females. Among the subjects, 28(46.7%) of them completed primary education, 22 of them (36.6%) completed secondary education and 10 subjects (16.7%) completed higher secondary education. Among them, 38 (63.3%) followed the Hindu religion, and most of the subjects 37(61.7%) belong to nuclear families. In the present study, about18 (30 %) of them worked as coolies, and majority of them were having a family income between 1001-4000.

The study findings also showed that the 19 (37.7 %) were suffering from oral cancer and 9(15%) were diagnosed with breast cancer. A similar study conducted showed that most of the subjects (58%) had breast cancer. In the present study, among the cancer patients, almost 23 (38.3 %) of them were having the duration of illness from 3-6 months. A similar study also concluded that most of the samples were suffering from the illness

for more than 3 months.[25] The current study showed that almost 28 (46.7%) of the subjects were hospitalized for more than 10 days. The modality of treatment revealed that 60(100 %) were treated using chemotherapy. A similar study also concluded that most of the patients diagnosed with cancer were treated with chemotherapy.

Section Ii: Findings Related To Objectives of The Study

Objective I: To assess the level of pain among patients receiving chemotherapy

In the present study, pain level of patients receiving chemotherapy was assessed before giving aromatherapy intervention using Numerical Pain Rating Scale. According to Numerical Pain Rating Scale, 6(10%) were having worst pain,28 (46.6%) were having severe pain, 21(35%) had moderate pain, and 5(8.33%) were having mild pain. A similar finding was concluded that pain is the most common side effect of chemotherapy.[19]

Objective II: To assess the level of depression among patients receiving chemotherapy

In the present study, depression was also assessed, using Beck Depression Inventory, the pre assessment showed that 33(55%) of them were having severe depression, 16 (26.6%) of them were having moderate depression, and 11(18.33%) were having mild depression and none of them had extreme depression. A similar finding found in the study was that 58% of the cancer patients were having depression.[22]

Objective III: To assess the effectiveness of Aromatherapy on pain and depression among patients receiving chemotherapy

In the present study, it was found that there is a reduction in the level of pain between the pre-test (63.0) and post-test (36.0) assessment using Numerical Pain Rating Scale in the experimental group and was found to be statistically significant with t=11.93, P<0.05). Whereas the control group was not having any significant change in terms of pain. This finding was also supported by a similar study, which showed statistically significant changes following aromatherapy, where there was an overall 60% reduction of pain in the experimental group.[26]

In the present study, it was found that there is a significant decrease in the level of depression pre-test (47.2) and post-test (35.0) assessment (t=8.05, P(0.05) using Beck Depression Inventory in the experimental group. Similar findings were found in the study conducted in the palliative care U.K, where there was a statistically significant decrease in depression (77%).

Objective IV: To find the association between the level of pain among patients receiving chemotherapy

An association between the study findings and the selected demographic and clinical variables with change in scores of pain using Numerical Pain Rating Scale. It showed that there was a significant association between gender (6.70), religion (7.82), type of family (4.29) and level of pain in the experimental group. There was no association between age, education, family income, type of cancer, duration of illness, and duration of hospitalization with level of pain in the experimental group.

Objective V: To find the association between the level of among patients receiving chemotherapy

An association between the study findings and the selected demographic and clinical variables with change of scores of depression using Beck Depression Inventory. It showed that there was significant association between gender (6.70), education (7.23), type of family (4.29),There was no association between other variables such as age, religion, family income, type of cancer, duration of illness, and duration of hospitalization in the experimental group.

The Chi- Square tests- Yates correction was used to find the association between the post test scores of the experimental group with the selected demographic and clinical variables.

Section III: Findings Related To Hypothesis Of The Study

H_1: There is a significant difference between pre-test and post-test pain score following aromatherapy among patients receiving chemotherapy in the experimental group.

The present study findings concluded that there is a significant difference in the pre-test and post-test pain score following aromatherapy among patients receiving chemotherapy in the experimental group. Hence, hypothesis H_1 is accepted.

H_2: There is a significant difference between the post-test pain scores of the experimental and the control group among patients receiving chemotherapy

The present study findings concluded that there is a significant difference between the post test pain scores of experimental group with a mean of 5.13 and control group with a mean of 3.6, with $t_{(58)=}6.02$ among patients receiving chemotherapy. Hence, hypothesis H_2 is accepted.

H_3: There is a significant difference between pre- test and post- test depression score following aromatherapy among patients receiving chemotherapy in the experimental group.

The present study findings concluded that there is there is a significant difference in the pre-test and post-test depression score following aromatherapy among patients receiving chemotherapy in the experimental group. Hence the hypothesis H_3 is accepted.

H_4: There is a significant difference between the post test depression scores of the experimental and control group among patients receiving chemotherapy.

The present study findings concluded that there is significant difference between the post test depression scores of experimental group with a mean of 22.6 and control group with a mean of 28.3, with $t_{(58)=}3.19$ among patients receiving chemotherapy. Hence, hypothesis H_4 is accepted.

H_5: There is a significant association between pain ,depression and selected demographic variables such as age, gender, education, occupation, type of family, family income, type of cancer ,duration of illness, and hospitalization

An association between the study findings and the selected demographic and clinical variables with change in scores of pain using Numerical Pain Rating Scale. It showed that there was a significant association between gender (6.70), religion (7.82), type of family (4.29), and level of pain.

An association between the study findings and selected demographic and clinical variables with change of scores of depressions using Beck Depression Inventory. It showed that there is significant association between gender (6.70), education (7.23), type of family (4.29). Hence, hypothesis H_5 is accepted.

CONCLUSION

The findings of the study revealed that the mean post-test pain and depression scores of patients receiving chemotherapy, who were exposed to aromatherapy was significantly higher than the mean post-test pain and depression scores of the control group. The findings indicated that aromatherapy is an effective complementary therapy to reduce pain and depression among patients receiving chemotherapy. The computed "t" value (11.93) for pain and (8.05) depression at 0.05 level of significance, were found to be significant. The study concluded that, the patients who received aromatherapy experienced decreased level of pain and depression, while the control group showed no reduction in the pain and depression level. Thus, aromatherapy is an effective complementary therapy in reducing pain and depression among patients receiving cancer chemotherapy.

Interest of conflict: Nil.

Source of funding: Self.

Ethical clearance: Permission was obtained from the ethical committee of Vydehi Institute of Nursing Sciences and Research Centre. Permission was obtained from the Head Of the department of Oncology, VIMS and RC. A written consent form was obtained individually from all subjects who participated in the study

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