A comparative study to assess the effectiveness of camphor oil versus eucalyptus oil application on level of joint pain among elderly population at selected rural areas

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Abstract:
Knee pain is one of the most common health problems in older adults. Knee osteoarthritis is one of the most important causes of chronic knee pain in older adults. NSAIDs are associated with significant risk of serious gastrointestinal adverse events in chronic use and local anaesthetics may cause cardiovascular, CNS toxicity and allergic reactions. Therapeutic use of essential oils absorbed through the skin or olfactory system. Although the benefits are many patients and healthcare providers are attracted to use of oil is beneficial, because of its low cost and minimal side effects. Objectives 1.To assess the level of joint pain among elderly population in experimental group A and B on joint pain. 2. To evaluate the effectiveness of camphor oil application on level of joint pain in experimental group A. 3.To evaluate the effectiveness of eucalyptus oil application on level of joint pain in experimental group B. 4.To compare the effectiveness of interventions among experimental group A and B on joint pain among elderly population. HYPOTHESIS:H0 – There will be no significant difference on level of joint pain after camphor oil and eucalyptus oil application among elderly population in both experimental group A and B. H1 - There will be significant difference on level of joint pain after camphor oil and eucalyptus oil application among elderly population in both experimental group A and B. A quantative research done with two group pre-test post-test experimental study conducted on Elderly population with joint pain in selected rural areas. There was 40 samples were (20-experimental group A and 20 experimental group B, non-probability purposive sampling technique was used. For the study Socio demographic variables such as Age, Gender, diet, Education, Occupation and modified numerical pain rating scale were used for data collection tool. The data collection was done Pre-test was conducted by using modified numerical pain rating scale in experimental group A and B among elderly populations in selected rural areas. Intervention administered by researcher, for GROUP A- Clean the area with soap and water. Followed by application of 3ml. Camphor oil repeated in morning and evening for 3 consecutive days. GROUP B- Clean the area with soap and water. Followed by application of 3ml. Eucalyptus oil repeated in morning and evening for 3 consecutive days. Post-test will be conducted on 4th day by modified numerical pain rating scale to assess the level of joint pain. Statistical analysis was conducted using paired t and unpaired t test to compared obtained data. Results shows that, in experimental group A before intervention there was 60 % samples with severe pain, 40 % with moderate pain and 0 % with mild pain. After intervention there was 5% samples with severe pain, 65 % with moderate pain and 30% samples found with mild pain. And In experimental group B before intervention there was 60 % with severe pain, 35 % with moderate pain and 0 % samples with mild pain. After intervention there was 80 %samples with mild pain, 20 % with moderate pain and 0 % samples with severe level of joint pain. There was pre-test mean score was 7.05 and post-test mean score 4 the calculated‘t’ value was 11.05 where p =0.000. In experimental group A, and pre-test mean score was 7 and post-test 4.95 the calculated t value was 14.54 where p=0.000. In experimental group B. The comparison of post-test mean score in experimental group A and B was 3.05 with standard deviation 1.23 and 4.40 with standard deviation is 1.35 .the calculated t value was 3.30 with $p < 0.0011$. Hence the study concluded that camphor oil application and eucalyptus oil application were effective on level of joint pain.

Keywords:
WHO - World Health Organization, NSAIDs- non steroidal anti-inflammatory drugs, CNS – central nervous system, OA- osteoarthritis, CAM – Complementary and alternative System of Medicines, WOMAC –Western Ontario and Mc Master Universities Osteoarthritis.
KOA – Knee Osteoarthritis, VAS – Visual Analog Scale, NRS – Numerical Pain Rating Scale.

1. Introduction:

Older persons constitute one of the most vulnerable sections of the society. They are not only physically weak but also lack in economic resources, self-esteem and social status[1].More recently Sir James Sterling Ross commented "You do not heal old age, you protect it, you promote it and you extend it". Aging is a major life change which includes physiological & psychological changes[2].

According to, Indian Association of Pain, pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage". Pain is major public health issue which has always been neglected by the people, unless and until severity has been occur. Non communicable diseases are the leading cause of hospitalization in our country, pain is one of them[3].

Camphor (Cinnamomum camphor) is a white, crystalline substance with a strong odour and pungent taste, derived from the wood of camphor laurel (Cinnamomum camphor) and other related trees of laurel family. Camphor is obtained through steam distillation, purification and sublimation of wood, twigs and bark of the tree[4].Eucalyptus globulus (Eucalyptus), which is widely used in folk medicine and aromatherapy. Eucalyptus globulus has a long history of folk usage because of its rich medicinal values. Terpineol, volatile terpenoid alcohol of low toxicity, is widely used in the perfumery industry. The plant has been reported to possess potent antiseptic, astringent, deodorant, diaphoretic, expectorant, inhalant, insect repellent, rubefacient and supportive properties.[5]

2. Background:

Musculoskeletal complaints are major health concerns around the world and topical analgesics such as non-steroidal anti-inflammatory drugs (NSAIDs) and local anaesthetics are used to relieve pain in muscles, joints and tendons. NSAIDs are associated with significant risk of serious gastrointestinal adverse events in chronic use and local anaesthetics may cause cardiovascular, CNS toxicity and allergic reactions[6]

Herbal medicinal products and chronic knee pain are research frontiers in herbal therapies for OA. As one of the major symptoms of OA, chronic knee pain seriously impairs the quality of life for patients. Many studies have indicated that herbal therapies can improve pain and slow the progression of OA.[7]." WHO also notes that "exceptionally, in some countries herbal medicines may also contain, by tradition, natural organic or inorganic active ingredients which are not of plant origin".[8]

3. Need for study:

The study was conducted on prevalence and risk factors of knee osteoarthritis in a rural community of Odisha. India has higher worldwide proliferative osteoarthritis (OA) rate and prevalence of knee osteoarthritis in India is 22-39%. The reported prevalence of knee OA in elderly in other studies done in India ranged between 32% and 64%. Pain limiting usual activity were higher among individuals who were female, older, less educated, rural residents, and low socio economic status.[9]

The Effects of herbal extracts have been studied by different pain tests including writhing test, light tail flick test, tail immersion test, hot-plate test, and formalin test. The exploration for new analgesic combinations from the enormous arrays of medicinal plant resources is growing.[10]

It has been discovered that, awareness of the joint pain is quite poor as compared to other type of pain. It is not only life issues, but also the burden of management. A major source of impairment, prevention efforts must be done, to treat joint pain with therapy as well as for elderly population.

4. Problem statement:

A comparative study to assess the effectiveness of camphor oil versus eucalyptus oil application on level of joint pain among elderly population at selected rural areas.

4.1. Objectives of study:

Primary objectives: To compare the effectiveness of interventions among experimental group A and B on

joint pain among elderly population.

4.2. Secondary objectives:

1. To assess the level of joint pain among elderly population in experimental group A and B on joint pain.
2. To evaluate the effectiveness of camphor oil application on level of joint pain in experimental group A.
3. To evaluate the effectiveness of eucalyptus oil application on level of joint pain in experimental group B.

4.3. Operational definition:

1. **Assess:** In this study it refers to check the level of joint pain by using modified numerical pain rating scale with color coding.
2. **Effectiveness**: In this study it refers to effect of camphor oil and eucalyptus oil application on level of joint pain.
3. **Joint pain**: In this study it refers to knee pain in joints.
4. **Camphor oil**: It refers to the mixture of 375 gm. of camphor in 1500ml of coconut oil, 3ml of camphor oil is applied on the painful joint for 10 min twice a day for 6 days.
   Eucalyptus oil: It refers to eucalyptus oil, purchased from local vendors; 3 ml of eucalyptus oil is applied for 10 min twice a day for 6 days.
5. **Elderly population**: In this study it refers to Population with age group 60 years and above.

4.4. Hypothesis:

H0 - There will be no significant difference on level of joint pain after camphor oil and eucalyptus oil application among elderly population in both experimental group A and B.

H1 - There will be significant difference on level of joint pain after camphor oil and eucalyptus oil application among elderly population in both experimental group A and B.

5. Research questions:

Does camphor oil and eucalyptus oil application have an effect on level of joint pain?

Delimitation: The study was delimited to elderly population in selected rural areas.

5.1. Scope of study:

1. This study will provide knowledge and information about the home remedies for joint pain.
2. The findings may guide recommendations for alternative to NSAIDs.
3. The findings may guide recommendations for alternatives to relieve pain in elderly populations.

5.2. Ethical aspects:

This topic of the study was approved by institutional ethical committee. The permission for conducting the study was obtained from the administrative department of selected hospitals. The nature of study, aims and objectives were explained to the subjects after assuring that their information would be kept confidential and used for research purpose only.

6. Conceptual frame work:

A conceptual framework is a theoretical approach to study the problems that are scientifically based which emphasizes selection, arrangement & classification of its concepts. Selecting a nursing conceptual framework helps the researcher to identify problem that are significant to the discipline of nursing.

The study was based on the concept that application of camphor oil versus eucalyptus oil on level of joint pain among elderly populations in rural area. The investigator adopted the General System Theory introduced by Ludwig Von Bertalanffy (1968).

According to this theory, a system is a group of elements that interact with one another in order to achieve the goal. It has 5 factors as follows.

1. Input:

It consists of information, material, or energy that enters the system.

In this study, it refers to elderly population belongs to 60 and above 60 years who are having joint pain. The input includes demographic variables such as age, gender diet, education & occupation of elderly population.

Pre-test is the assessment of level of pain recorded with modified numerical pain scale.

2. Process:

In this study, it refers to cleaning the area with soap and water. Followed by application of 3ml. camphor oil repeated in morning and evening for 3 consecutive days.

And In this study, it refers to cleaning the area with soap and water. Followed by application of 3ml. eucalyptus oil repeated in morning and evening for 3 consecutive days.

3. Output:

In this study, it refers to post-test assessment of level of joint pain using modified numerical pain scale on 4th day.

4. Environment:

Individual environment is a consent that influences the system. In this study environment refers to the selected rural areas.

7. Review of literature:

A cross-sectional study on prevalence of self-reported pain, joint complaints and knee or hip complaints in adults aged ≥ 40 year in Herne, Germany. The sample size was 2221. Random sampling technique was used. Pain was assessed by using self-completed postal questionnaires. The result revealed that there 59.7% sample with current pain, the past four weeks pain was present in 74.5% sample, 49.3% sample current joint pain, 62.8% shows joint complaints within the past four weeks and joint complaints with twelve months 67.4%, knee as the site predominantly affected i.e. 30.9%, 9.7% sample show knee bilateral, hip pain was 15.2%, in 3.5% sample hip bilateral, knee and hip: 5.5%. Hence the study concluded that Pain and musculoskeletal complaints were significantly more often reported in women.[11]

A cross sectional study was conducted on Prevalence of chronic pain based on primary health centre data from a city in central India. The sample 1674 was selected by using stratified sampling technique patients who attended a Primary Health Centre (PHC) over a period of two months. Information regarding name, age, gender, occupation, chief complaints and its duration was obtained. Prevalence of chronic pain (pain more than 3 months) was analysed. Out of 1674 patients, there were 496 patients with pain resulting into a prevalence of 29.63%. The prevalence of chronic pain amongst these patients was 19.23%. It was predominant in females and age group of 21-60 years. Prevalence of chronic back pain was highest (24.84%), followed by body pain (22.98%), Knee (16.77%), Chest (13.97%). Upper limb (10.87%). Study concluded that almost one third of the patients visiting PHC have pain as the chief complaint. Females report pain much more commonly than males.[12]

A cross-sectional study was conducted on Nursing student's attitudes and understanding of complementary and alternative therapies: an Indian perspective regarding complimentary alternative medicine (CAM). The sample 122 students was selected by using convenience sampling technique and self-administered questionnaires were used to evaluate the study. A majority of the participants (89.3 percent) felt that Ayurveda is highly/moderately effective and agreed with CAM, indicating positive attitudes toward CAM therapies. Lack of evidence, lack of staff training, unavailability of credentialed providers, and lack of appropriate equipment were seen as the main barriers to practicing CAM therapies. They concluded that introducing complementary and alternative medicine CAM in the nursing curriculum is needed to prepare future community nurses. Continuing education/training in CAM is needed by nurses to provide holistic care.[13]

A comparative study was conducted on efficacy and safety of massage for osteoarthritis of the knee. A randomized clinical trial was done on massage. The assessments at 8, 16, 24, 36, and 52 week's interval. Total 551 samples selected out of 222 with knee osteoarthritis, 200 samples completed 8 weeks assessment, and 175 completed 52 weeks assessment. The Intervention was for 60min of protocolized full-body massage or light-touch. Visual analog pain scale, promise pain interference, knee range of motion and timed 50 feet walk secondary scale was used. The results showed 8 weeks, massage significantly improved WOMAC global scores compared to light-touch and usual care. The study concluded that, there was efficacy of symptom relief and safety of weekly massage make it an attractive short-term treatment option for knee osteoarthritis.[14]

A true experimental study was conducted on effectiveness of home care management and remedial practices on knee joint pain among elderly at selected communities in Coimbatore. Total 60 samples selected by probability random sampling technique, age group of 60-80 years, were divided in two experimental and control group. Data was collected using numerical pain. Hot water application, oil massage, exercise and diet education was administered for 30 minutes with the period of 6 weeks. The result showed that; home care management and remedial practices were more effective in reducing the knee joint pain. The study

concluded that; home care management and remedial practices was very suitable and practicable than non-pharmacological measures of reducing knee joint pain among elderly.[15]

A pre-experimental study was conducted on effectiveness of camphor oil application on reduction of joint pain among menopausal women at selected rural areas, Coimbatore. One group pre-test post-test design was used. Total 50 sample of menopausal women were selected by non-probability convenience sampling technique. Numerical pain intensity scale was used for data collection. The result showed the mean pre-test score on severity of joint pain was 6.74 and that of post-test 3.86. The study concluded that camphor oil application is effective on reduction of the severity of joint pain among menopausal women.[16]

A Quantitative study was conducted on effect of Camphor Oil on Level of knee joint pain among elderly old age home of Sangli Miraj Kupwad Corporation area. The objectives were to assess the level of Knee joint pain before application of camphor oil in experimental & control group among elderly, To assess the level of knee joint pain after application of camphor oil in experimental and control group among elderly, to compare the pre-test and post- test level of knee joint pain among elderly, to compare the experimental and control group post-test level of knee joint pain among elderly. A quasi-experimental control group pre-test and post-test research design was adopted for this study. 40 elderly (20 in experimental group and 20 in control group) populations selected by non-probability purposive sampling technique. Data collection was done by using demographic variables, pain scale for level of knee joint pain. The result showed that there was significant difference in experimental group after intervention of camphor oil also there was difference between pre-test and post-test pain score on level of knee joint pain in experimental and control group. Hence it concluded that reduced knee joint pain was more common in those over the age of 60 years, after application of camphor oil on knee joint pain Level of pain is reduced.[17]

8. Research methodology:

8.1. Research approach:

The present study aimed to assess the effectiveness of Camphor oil and Eucalyptus oil application on level of joint pain. In a view to the nature of problem selected for the study, quantitative evaluative approach is appropriate.

8.2. Research design:

In this study, for analysis two observation scoring is taken (pre- test score and post test score of 4th day) and intervention is given 2 times a day for 3 days. There are only two observations (Pre-test & pot-test) so, the study is Experimental two group's Pre- test Post-test design. The interpretation of the symbols is as follows:

8.3. Variables of the study:

There are two variables identified in this study.

Independent Variables: In this study independent variable is application of camphor oil and eucalyptus oil.

Dependent Variable: In this study dependent variable is level of joint pain.

8.4. Settings of the study:

Selected rural areas, as a place for data collection based on the criteria of the study which includes elderly population with joint pain.

8.5. Study population:

In this study population is the entire aggregation of cases that meet a designed set of criteria. The population are accessible and target population.

Target Population: In this study, the target population belongs to elderly population.

Accessible Population: In this study, the accessible population comprised of elderly population with joint pain.

Sample: In the present study the sample belongs to the elderly population with joint pain.

Sample size: In this study, the sample in experimental group comprised of 40 elderly population (Group A and Group B) each group comprised of 20 elderly population with joint pain in selected rural area.

8.6. Sampling technique:

In the study non-probability purposive sampling technique will be adapted for selection of population. The samples were selected as per the purpose of the investigator, samples in selected rural area were assigned to experimental groups.

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8.7. Criteria for selection of the sample:

In this study following criteria is used to select the samples.

Inclusion criteria:

1. Subjects with joint pain between the age group 60 years and above.
2. Those present at the time of data collection.

Exclusion criteria:

1. Allergic to camphor oil or eucalyptus oil.
2. Wound or cracks on skin.

8.8. Development of tool:

Data collection tool are the procedures or instrument's used by the investigator to observe or measure the key variables in the research problem.

The tool is developed by the researcher with reference of books, review of literature and under the guidance of experts. In this study the tool is prepared on the basis of the objectives of the study.

The following steps are adopted prior to the development of tool:

1. Review of literature provide adequate content area for the tool preparation. Various literatures have been referred to compare the level of pain after application of camphor oil and eucalyptus oil on level of joint pain.
2. Consultation and discussion is done with nursing experts related to the selection of topic and about the workout plan.
3. Personal experience and discussion with colleagues is considered.

8.9. Description of tool:

The tool consisted of two sections

Section I: Demographic variables

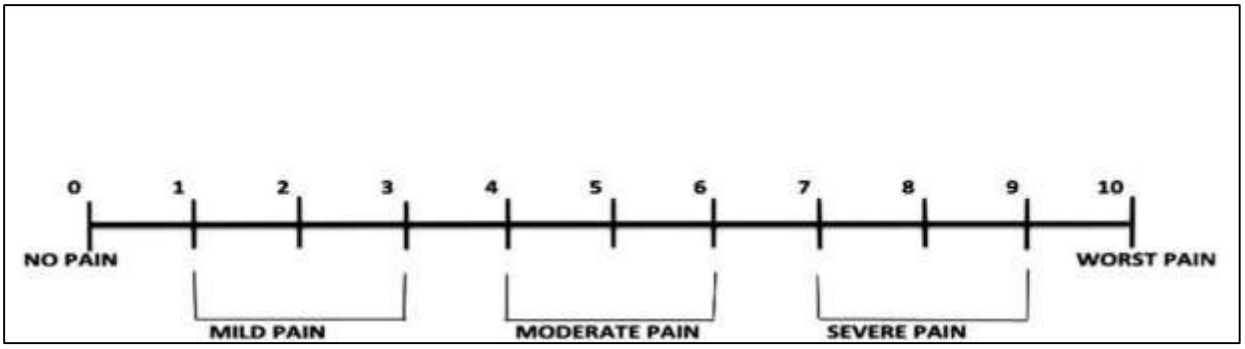
It describes age, gender, marital status, education status, occupational status.

Section II: Modified Numerical Pain Rating Scale.

Numerical pain rating scale consist of 1to10 number. It is a series of numbers ranging from 0 to 10, where the 2 respective endpoints are "0" (no pain) and "10" (worst imaginable pain).

8.9. Testing of the tool:

The tool selected for data collection will be tested for its content validity feasibility and reliability.



9. Validity:

To ensure the content validity, the tool will be given to experts from different fields. The experts include 11 Nursing experts, 2 Doctor, 1 BHMS and 1 Statistician. The experts were requested to give their opinions and suggestions regarding the relevance of content and whether they agree or disagree with the tool or instrument and provide the necessary remarks.

Few suggestions were given by experts and changes were made accordingly.

10. Reliability:

The reliability of modified numerical pain rating scale was calculated. Reliability was 0.74 Which was acceptable. Hence tool for the research study was considered reliable.

11. Pilot study:

Pilot study was conducted on 16 elderly population with joint pain at selected rural area, from 21.102024 to 26.10.2024. The pilot study data analysis included both descriptive and inferential statistics. The written permission was obtained from the Head of village and Medical Officer of selected rural area prior to the data collection. The aims, objectives and nature of the study were explained to the participants. Confidentiality was assured to all the participants and a written consent was obtained from them. After initial survey elderly population with joint pain were selected and purposely assigned to both in experimental groups. Analysis of data was done using descriptive and inferential statistics. The tool was approved to be feasible and practicable.

12. Data collection procedure:

Data gathering means information is systematically collected in course of the study.
Before the actual data collection the investigator had completed the following formalities.

1. Permission will be obtained from local ethical committee and concerned the concerned authorities of selected rural area.
2. Informed consent will be taken from subjects.
3. Sensitivity test will be done prior to 24 hrs. Of pre-test in both samples group A and group B.
4. Total no of 40 subjects will be selected. Experimental group A (20), experimental group B (20) by using purposive sampling technique according to inclusion and exclusion Criteria.
5. Pre-test will be conducted by using numerical pain scale to assess the level of joint pain.
6. Intervention will be administered by researcher,

Group A: Cleaning the area with soap and water. Followed by application of 3ml. camphor oil repeated in morning and evening for 3 consecutive day.
Group B: Cleaning the area with soap and water. Followed by application of 3ml. eucalyptus oil repeated in morning and evening for 3 consecutive day.

7. Post-test will be conducted on 4th day by using same scale.
8. Data will be analysed and interpreted.

13. Plan for data analysis:

The data obtained will be analysed using both descriptive and inferential statistics based on objectives and research question of the study.

Experimental Group A=20, Experimental Group B =20

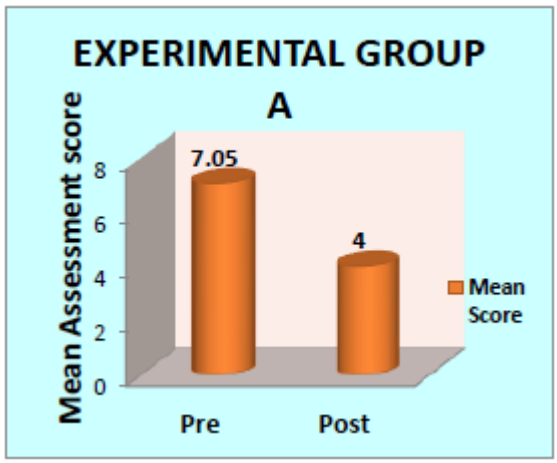
Table. 1: Frequency Distribution N=40

Sr. No	Variables		Experimental group (a)		Experimental group (b)	
			frequency (f)	Percentage (%)	Frequency (f)	percentage (%)
1	**Age**	60-69 years	11	55%	12	60%
		70-79 years	8	40%	6	30%
		80-89 years	1	5%	2	10%
		90 years and above	0	00%	00	00%
2	**Gender**	Male	3	15%	2	10%

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		Female	17	85%	18	90%
3	**Diet pattern**	Veg diet	5	25%	6	30%
		Mixed diet	15	75%	14	70%
4	**Education**	Illiterate	2	10%	4	20%
		Primary	9	45%	5	25%
		Secondary	6	30%	8	40%
		Graduate and Above	3	15%	3	15%
5	**Occupation**	Working	13	65%	11	55%
		Non - working	7	35%	9	45%

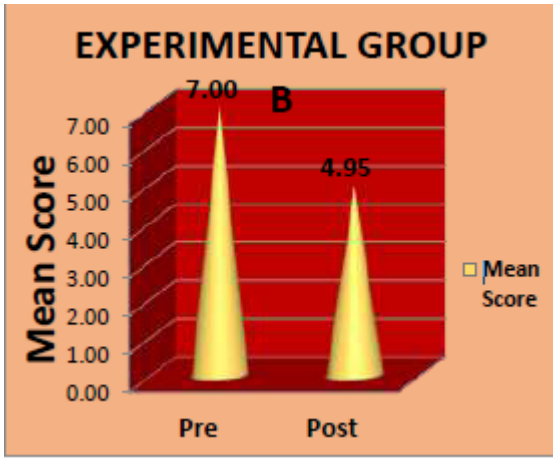
GRAPH NO. 1:



Cylinder bar graph showing difference between pre-test and post-test mean score in experimental group A.

The graph depicts that, pre-test mean score in experimental group A was 7.05 and post-test mean score was 4.0 with standard deviation 1.298.

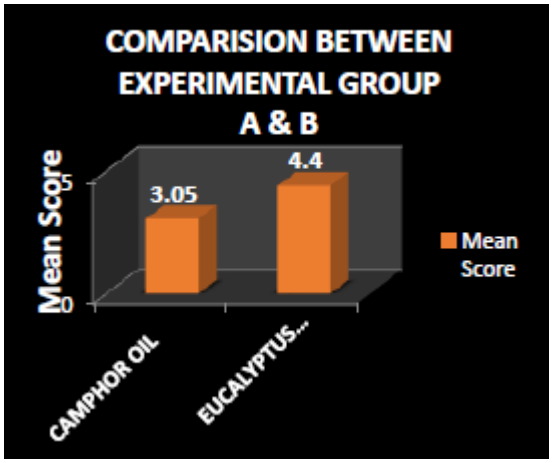
GRAPH NO.2



Cone graph showing difference between pre - test and post -test mean score experimental group B.

The above graph depicts that, pre-test mean score in experimental group B was 7.00 and the post-test mean score was 4.95.

GRAPH NO. 3:



Bar graph showing difference between experimental group A and experimental group B.

The above graph depicts that, post- test mean score in Experimental group A was 3.05 and the post-test mean score in Experimental group B was 4.40

14. Discussion:

In the present study, experimental group A carries, 12 (60%) samples had severe pain i.e. 7-9 scores, 8 (40%) samples had moderate pain i.e. 4-6 scores, 0 (0%) had mild pain before Camphor oil application. 1 (5%) samples had severe pain i.e. 7-9 scores, 13 (65%) samples had moderate pain i.e. 4-6 scores, 6 (30%) had mild pain after Camphor oil application. experimental group B carries, 13 (65%) samples had severe pain i.e. 7-9 scores, 7 (35%) samples had moderate pain i.e. 4-6 scores, 0 (0%) had mild pain before Eucalyptus oil application. 0 (0%) samples had severe pain i.e. 7-9 scores, 4 (20%) samples had moderate pain i.e. 4-6 scores, 16 (80%) had mild pain after Eucalyptus oil application. Post-test mean scores in Experimental group A was 3.05 and standard deviation 1.23. The post-test mean score in Experimental group B was 4.40 and standard deviation 1.35. The test calculated paired t value was 3.30with p ($p<0.001$). Thus it concluded that Eucalyptus oil application shows significantly higher effectiveness. Thus Eucalyptus oil application can be considered more effective as compared to Camphor oil application.

Hence H_0 is rejected and H_1 is accepted. It showed that the eucalyptus oil application is more effective than the camphor oil in reducing level of joint pain.

15. Conclusion of the study:

The conclusion drawn from the findings of the study are as follows:

1. Review of Literature has helped the investigator to gain in depth knowledge of the content, to develop conceptual framework for the study, tool for data collection and analysis of data.
2. The purpose of the study to determine the effectiveness of camphor oil versus eucalyptus oil application on reducing level of knee joint pain have proved statistically and found effective in treating knee joint pain among elderly population.

Overall, carrying out the present study was really an enriching experience for the investigator. The direction from guide, various experts and co-operation of participants played major role in successful completion of various study.

15. 1. Nursing implication:

The findings of the study have several important implication for nursing practice, education, research and policy regarding joint pain management and care of elderly.

15.2. Nursing practice:

Camphor oil & eucalyptus oil application are cost effective, easily available interventions to treat joint pain. Since these are natural treatments and had no side effects it can be practiced in community as well as in clinical setting in order to relieve pain and discomfort in elderly population caused by joint pain. In recent years, nursing practice has undergone many evolutions. These findings Was very helpful in community health nursing practice because the performance of the intervention is very simple and mainly it is evidence-based practice, it is also economical as it is easily available. This intervention also reduces the expense of medications used for joint pain and discomfort.

15.3. Nursing education:

Camphor oil & eucalyptus oil are used for various ailments such as pain, allergies, anesthetic agent and aromatherapy which have already been included in the nursing curriculum. The student nurses can study the physiological effects of Camphor oil & eucalyptus oil in level of pain. The nursing curriculum should give importance to nursing interventions rather than medical management, and application of evidence based practices that are economical, affordable and acceptable among elderly populations and their family.

15.4. Nursing administration:

Effective strategies to joint pain with use of non-pharmacological methods such as Camphor oil & eucalyptus oil application should be considered by a nurse administrator when designing materials, policies, forms and procedures for obtaining effective, economical, acceptable, and non-pharmacological complements to nursing care. The nurse administrator should also see that the student and practicing nurses are well equipped with knowledge and skill through in-service programs. Nurses may be empowered with facilities to use these treatments.

15.5. Nursing research:

The aims of nursing research are to contribute the knowledge to expand and broaden the scope of nursing. The nurse researcher can utilize the study finding in developing model/theory/conceptual frame work. Based on the finding of the further study the future research can be undertaken.

15.6. Limitations:

1. The study was included only population who were in rural area.
2. The study was conducted on small sample size.
3. The study was limited with only with elderly population.

16. Recommendations:

Based upon the study findings, the following recommendations were made for future study.

1. A similar study can be replicated on a large sample in different settings to strengthen the findings.
2. A comparative study can be conducted to assess the effectiveness of Camphor oil & eucalyptus oil application in combination with other complimentary therapies.
3. A similar study can be conducted for 5 days at hospital setting.
4. Planned teaching programme can be done on knowledge of staff nurse regarding Camphor oil & eucalyptus oil application over joint pain.

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