



A Comparative Study to Assess the Effectiveness of Mustard oil with Garlic Application versus Camphor oil Application on level of Knee Joint Pain among Elderly Person at selected Community Areas of Durg, Chhattisgarh

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Abstract

Introduction: Knee joint pain is one of the most common musculoskeletal problems among elderly people, mainly due to degenerative changes, osteoarthritis, and reduced physical activity. Traditional home remedies such as mustard oil with garlic and camphor oil are widely used for pain relief.

Aim of the study was to compare the effectiveness of mustard oil with garlic application Vs camphor oil application on level of knee joint pain among elderly people.

Methodology: A true experimental two parallel group research design was adopted. A total of 50 elderly persons (≥ 60 years) with knee joint pain were selected using probability simple random sampling technique from selected community areas of Durg, Chhattisgarh. The participants were randomly assigned into two groups: Experimental Group one 25 samples (mustard oil with garlic application) and Experimental Group two (camphor oil application), with 25 participants. Pain was assessed using a standardized Global Pain Scale before and after the intervention. Data were analyzed using descriptive and inferential statistics including mean, standard deviation, paired t-test, unpaired t-test, and chi-square test.

Results: Outcome of the study was camphor oil group showed no statistically significant reduction in knee joint pain (mean pre-test 89.72, post-test 88.20, $t = 0.33$, $p > 0.05$). In contrast, the mustard oil with garlic group demonstrated a statistically significant reduction in pain (mean pre-test 96.17, post-test 86.18, $t = 2.7$, $p < 0.05$).

Conclusion: Mustard oil with garlic application was found to be more effective than camphor oil application in reducing knee joint pain among elderly people. This low-cost, safe, and easily available intervention can be recommended for community-based pain management.

Keywords: Knee joint pain, elderly, mustard oil, garlic, camphor oil, comparative study

Introduction

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage [1]. Aging leads to structural and functional changes in the musculoskeletal system, resulting in decreased joint flexibility, muscle strength, and cartilage degeneration [2]. Knee pain is a primary cause of disability; studies show about 58% of affected elderly become dependent on others for daily tasks like walking, standing, or personal hygiene [3]. Knee pain is one of the most prevalent complaints among elderly individuals and affects nearly 25% of people

above 55 years of age [4]. Knee joint pain is commonly caused by osteoarthritis (OA), injuries, obesity, and reduced physical activity [5]. Persistent pain affects mobility, independence, and quality of life. Traditional Indian remedies such as mustard oil massage and garlic application are widely used to improve blood circulation, reduce inflammation, and relieve joint stiffness [6]. Camphor oil is also commonly used due to its analgesic and anti-inflammatory properties [7]. Knee pain (Osteoarthritis) affects nearly 47% of India's elderly

[8]. With the elderly population expected to grow from 7.4% in 2001 to nearly 19% by 2050, the burden is significant [9]. Women and those in rural areas like Chhattisgarh face higher risks due to manual labor, obesity, and limited access to specialized care [10]. Women are twice as likely to suffer, with a prevalence of 50.7% compared to 26.2% for men [8]. Hence, the present study was undertaken to compare the effectiveness of mustard oil with garlic application versus camphor oil application on knee joint pain among elderly people.

Objectives:

- To evaluate the effectiveness of mustard oil with garlic application on knee joint pain among elderly people.
- To evaluate the effectiveness of camphor oil application on knee joint pain among elderly people.
- To compare the effectiveness of mustard oil with garlic application versus camphor oil application.
- To find the association between knee joint pain and selected demographic variables.

Review of Literature:

Gysel and Sindhuja (2023) conducted a quasi-experimental study to evaluate the effectiveness of camphor oil application on joint pain among 60 older adults (aged >50 years) in a selected village in Punducherry. The researchers utilized purposive sampling to divide participants into an experimental group (n=30) and a control group (n=30). They had one group use warm camphor oil twice a day for five days, while a control group did not. Using the WOMAC scale to measure pain, they found that the camphor oil group had significantly less pain by the sixth day. conclusion that camphor oil is an effective non-pharmacological intervention for managing geriatric joint pain.

Maheshwari M. (2016) conducted a study in Medavakkam to evaluate the effect of **mustard plaster** on knee pain among women aged 50–60. Using a group of 60 participants, she applied a mustard powder paste to the affected area for 10 minutes daily over 5 days. The results showed a **13.7% reduction in pain** for the experimental group, which was statistically significant compared to only 1.3% in the control group. The study concluded that mustard

plaster provides soothing relief and effectively reduces knee pain.

Research Material and Method: This study uses a true experimental two-parallel group design to compare two different treatments for knee pain.

Inclusion Criteria and Exclusion Criteria: The study population comprised elderly individuals aged 60 years and older who reported chronic or persistent knee joint pain and willing to participate. Those with had allergy to mustard oil garlic and camphor and taking analgesics medication were excluded.

Study Procedure :

Prior to the commencement of the study, formal permission was obtained from the relevant local authorities. Participants were recruited with the assistance of **Accredited Social Health Activists (ASHA)**. A total of 100 elderly individuals reporting chronic knee joint pain were initially screened across two locations: **Kurud** and **Khamhariya**. Inclusion criteria focused on elderly participants with documented knee pain and a willingness to participate. **Informed consent** was obtained from all participants, and a professional **Inter-Personal Relationship (IPR)** was established to ensure comfort and compliance throughout the 15-day period.

Randomization and Group Allocation

A sample size of 50 participants was finalized (25 per group). Randomization was performed using a computer-generated random number table to ensure unbiased allocation: Experimental Group 1 (25 participants): Received Mustard Oil with Garlic application. Experimental Group 2 (25 participants): Received Camphor Oil application (Comparison Group).

Data Collection Tools

The study utilized two primary sections for data collection:

Section A: A socio-demographic questionnaire to capture age, gender, and lifestyle variables.

Section B: The **Standardized Global Pain Scale** and assessment of **Range of Motion (ROM)** exercises to measure functional capacity.

Intervention Protocol

The intervention followed a structured 15-day timeline for both groups: **Baseline (Day 1):** Pre-test assessments were conducted between 9:00 AM and 2:00 PM. Baseline pain levels were recorded using the Global Pain Scale. **Treatment Phase (Days 2–15):** On the first day of application, researchers spent **20–30 minutes** with each participant to demonstrate the correct application technique. Subsequent daily sessions lasted **10–15 minutes** per participant. Interventions were conducted daily for 5–6 hours per day across the sample. **Mid-intervention assessment** was conducted on **Day 7**. **Final post-test assessment** was conducted on **Day 15** to evaluate the total reduction in knee joint pain.

Outcome measures and data analysis:

Data were analyzed using IBM SPSS (25 version). Descriptive statistics, including **frequency, percentage, mean, and standard deviation**, were used to describe demographic data and pain scores.

Inferential statistics (Paired and Unpaired t-tests) were applied to compare the efficacy between the Mustard Oil/Garlic and Camphor Oil interventions. A P value < 0.05 was considered statistically significant.

Result : The present study evaluated the comparative effectiveness of mustard oil with-garlic application and camphor oil intervention on reducing knee joint pain among elderly people. The finding revealed that both intervention effective for reducing knee joint pain but as compare to camphor oil application mustard oil with garlic application is more effective. [Tables 1-6]

Discussion: study evaluated the comparative evaluation of two interventions- mustard oil with garlic application and camphor oil application on reducing knee joint pain among elderly. his study evaluated the impact of mustard oil with garlic versus camphor oil on knee joint pain among elderly participants.

Table 1: Chi square analysis to find out association between level of pain among elderly people (group 1) with their selected socio-demographic variables.

Socio idemographic ivariable i	Pre test level of pain among elderly people			
	Chi isquare			
	Chi square value	df	Critical ivalue i	Inference i
Age	21.16	9	16.92	Significant
Gender	0.488	6	12.59	Not significant
Education	14.93	18	28.87	Not significant
Occupation	104.06	27	40.11	Significant
Family income	14.27	18	28.87	Not significant
Socio economic class	14.78	12	21.03	Not significant
Marital status	8.70	9	16.92	Not significant
Dietary pattern	15.65	6	12.59	Significant
Do you have knee pain	4.01	3	7.82	Not significant
Do you have allergies	0	3	7.82	Not significant
Previous diagnosed disease	0	3	7.82	Not significant
Taken treatment	0	3	7.82	Not significant

Table 2: Chi square analysis to find out association between level of pain among elderly people (group 2) with their selected socio-demographic variables

Socio idemographic ivariable i	Pre test level of pain among elderly people			
	Chi isquare			
	Chi square value	df	Critical ivalue i	Inference i
Age	13.21	9	16.92	Not significant
Gender	2.09	6	12.59	Not significant
Education	50.41	18	28.87	Significant
Occupation	36.41	27	40.11	Not significant
Family income	36.27	18	28.87	Significant
Socio economic class	24.4	12	21.03	Significant
Marital status	16.6	9	16.92	Not significant
Dietary pattern	12.8	6	12.59	Significant

Table 3: To evaluate the effectiveness of mustard oil with garlic application on level of knee joint pain among elderly people in experimental group 1.

Criteria	Mean	SD	Paired t value	Critical Value	df	Significance
Pretest	96.17	0.9	2.7	2.06	24	P<0.05 HS
Posttest	90.28	0.4				

Table 4: To evaluate the effectiveness of camphor oil application on level of knee joint pain among elderly people in experimental group 2 (compare group).

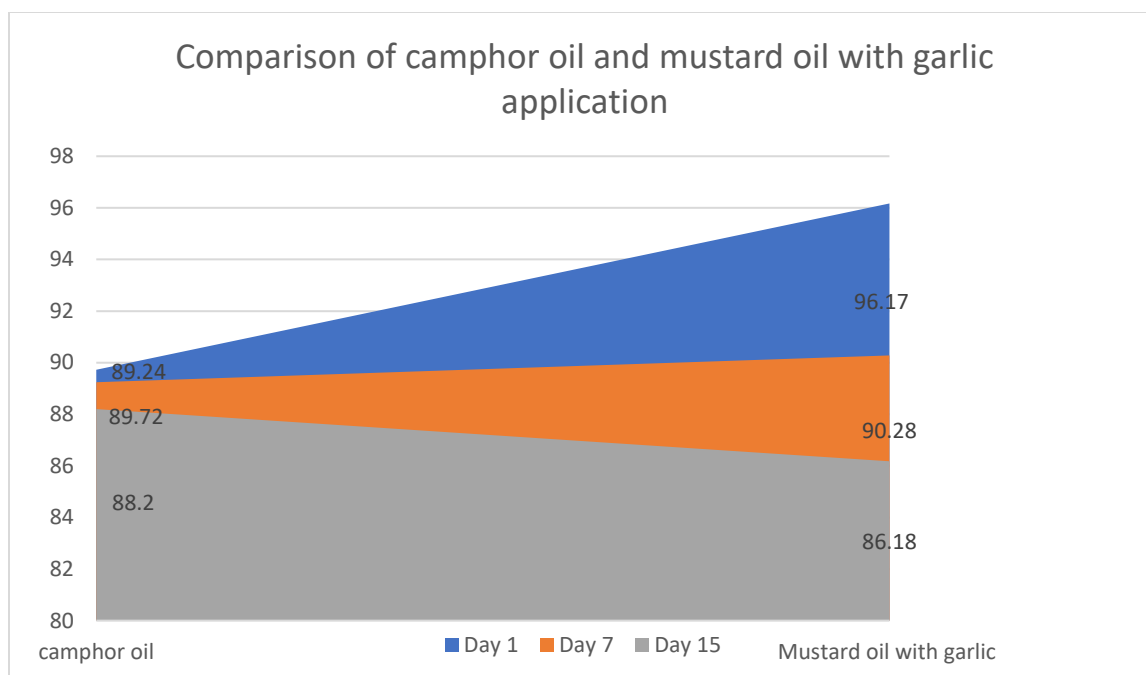
Criteria	Mean	SD	Paired t value	Critical Value	df	Significance
Pretest	89.72	0.6	0.33	2.06	24	P<0.05 NS
Posttest	89.24	0.2				

Table 5: To compare the effectiveness of mustard oil with garlic application Vs camphor oil application on level of knee joint pain among elderly people.

Domain	Criteria	Days	Mean	SD	Paired t value	Critical Value	df	Significance
Camphor oil application	Pre test	Day 1	89.72	0.6	0.33	2.06	24	P>0.05 Non significant
	Post test	Day 7	89.24	0.2				
	Post test	Day 15	88.20	0.1				
Mustard oil application with garlic	Pretest	Day 1	96.17	0.9	2.7	2.06	24	P<0.05 HS
	Posttest	Day 7	90.28	0.4				
	Post test	Day 15	86.18	0.2				

Table 6: To compare the level of knee joint pain between group 1 {mustard oil application with garlic} and group 2{camphor oil application} among elderly people

Domain	Criteria	Days	Mean	SD	Un-paired t value	Critical value	Df	Significance
Camphor oil application	Post test	Day 15	88.20	0.1	1.92	2.06	24	P>0.05 Non significant
Mustard oil with application with garlic	Post test	Day 15	86.18	0.2	3.1	2.06	24	P<0.05 HS



Summary

The findings indicate a **high level of satisfaction with the overall Dabur Real experience**, with 71.3% of respondents giving favourable responses and a mean score of **3.84 out of 5**. This places the statement firmly in the “**Agree**” range, suggesting that the **overall consumer experience is a significant strength of Dabur Real** and that most respondents are satisfied with the brand. It was identified that, the mean pre test and post test level of joint pain was 96.17 and 90.28 respectively. Standard deviation was 0.9 and 0.4 and the calculated ‘t’ value was 2.7. While comparing with table value, it showed that the calculated ‘t’ value was greater than the table value at 0.05 level of significance. While comparing with table value, it showed that the calculated ‘t’ value was greater than the table value at 0.05 level of significance. Thus the research hypothesis, stated There will be a significant difference in the pre test and post test level of knee joint pain among elderly was accepted.

Compares the effect of camphor oil application and mustard oil with garlic on knee joint pain among elderly people using an unpaired t-test. The mean post-test pain score for camphor oil was 88.20, while for mustard oil with garlic it was 86.18. The calculated t-value for camphor oil was 1.92, which was less than the table value at 0.05 significance, showing no significant effect. The t-value for mustard oil with garlic was 3.1, which was greater than the table value at 0.05 significance, indicating a significant reduction

in knee joint pain. Hence, mustard oil with garlic was effective, whereas camphor oil showed no significant impact.

The calculated value of chi square for age (21.16), occupation (104.06), dietary pattern (15.65) were significant, Hence it is concluded that age, occupation, dietary pattern were associated with level of pain were as gender, education, family income, socio economic class, marital status, do you have knee pain, do you have allergies, previous diagnosed, taken treatment were not associated with level of pain.

The calculated value of chi square for education (50.41), family income (36.27), socio economic class (24.4), dietary pattern (12.8). Hence it is concluded that education, family income, socio economic class, dietary pattern were associated with level of pain were as age, gender, occupation, marital status, do you have knee pain, do you have allergies, previous diagnosed disease, taken treatment were not associated with level of pain.

It was identified that, the mean pre test and post test level of joint pain was 89.72 and 89.24 respectively. Standard deviation was 0.6 and 0.2 and the calculated ‘t’ value was 0.33. While comparing with table value, it showed that the calculated ‘t’ value was lesser than the table value at 0.05 level of significance. While comparing with table value, it showed that the calculated ‘t’ value was lesser than the table value at 0.05 level of significance. Thus the research

hypothesis, stated There will be a no significant difference in the pre test and post test level of knee joint pain among elderly was accepted. Hence, camphor oil application on the level of knee joint pain among elderly people were not effected.

Mustard oil with garlic was found to be significantly effective, with mean pain scores decreasing from 96.17 to 90.28 ($t=2.7$, $p< 0.05$). This aligns with findings by Sharma, Kaur, and Kaur (2021), who also noted that this combination serves as an effective home remedy for reducing pain levels. Conversely, camphor oil did not yield a statistically significant difference in pain relief in this specific study group, as the calculated t -value (0.33) was less than the table value at a 0.05 significance level. This outcome contrasts with observations by Mr. Dipak Rajput (2024), whose research suggested that camphor oil massage could reduce discomfort in individuals over 60. Overall, these results highlight mustard oil with garlic as a more reliable intervention for managing geriatric knee pain in this clinical context. The study demonstrated that mustard oil with garlic application significantly reduced knee joint pain in elderly participants, as indicated by a t -value of 3.1, which exceeded the critical threshold for statistical significance ($p<0.05$). In contrast, camphor oil application did not show a significant impact on pain levels, with a t -value of only 1.92, which was below the required table value.

Conclusion

Mustard oil with garlic application is more effective than camphor oil in reducing knee joint pain among the elderly. Its safety, low cost, and high availability make it an ideal intervention for rural community health programs in India. These findings suggest that the warming and anti-inflammatory properties of the mustard oil and garlic combination provide a more effective home remedy for geriatric joint discomfort than camphor oil.

Recommendation –

1. Need more time for follow-up.
2. Include at least 1 – 3 month for intervention.
3. Application of mustard oil with garlic and camphor oil with an exercise

Ethical clearance: The ethical clearance was obtained from the IEC committes from Govt. College of nursing , Durg Chhattisgarh.

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