

RESEARCH ARTICLE

Effectiveness Of Mustard Paste Application on Level of Knee Joint Pain and Stiffness Among Elderly

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Abstract: This study aims to assess the efficacy of mustard paste application in alleviating knee joint pain and stiffness among elderly individuals residing in Sangli-Miraj-Kupwad Corporation. With an increasing focus on natural remedies, mustard paste presents a promising avenue for managing joint symptoms, given its historical use and potential bioactive properties. Objectives: 1. To assess the level of knee joint pain and stiffness among elderly before application of mustard paste. 2. To assess the level of knee joint pain and stiffness among elderly after application of mustard paste. 3. To compare the post-test level of knee joint pain and stiffness among elderly in experimental group and control group. Methodology: Research Design: Pre-test post-test with control group design. Sample Size: Total of 62 elderly participants (Experimental Group: 31, Control Group: 31). Intervention: Mustard paste application on knee joints in the experimental group. Data Collection: Demographic data, including gender, education, and occupation, were collected. Pain and stiffness levels were assessed using standardized measures before and after intervention. Data Analysis: Descriptive statistics, t-tests, and ANOVA were used to analyse the data. Results: Demographic Analysis: Majority of males, primarily educated individuals, and diverse occupations in both groups. Pain Assessment: Experimental group showed significant reduction in pain post-application of mustard paste ($p < 0.05$). Stiffness Assessment: Experimental group exhibited notable decrease in stiffness post-application ($p < 0.05$). Statistical Analysis: Significant differences between experimental and control groups in pain and stiffness levels post-intervention ($p < 0.05$). Conclusion: Mustard paste application effectively reduced knee joint pain and stiffness among elderly individuals in Sangli-Miraj-Kupwad Corporation. The study highlights the potential of mustard paste as a natural remedy for managing knee joint symptoms, suggesting its feasibility as an alternative or complementary treatment option in elderly populations.

Keywords: Mustard paste, Knee joint pain, Knee joint stiffness.

INTRODUCTION

Osteoarthritis (OA) is a prevalent musculoskeletal disorder leading to chronic pain and disability, especially among adults. The global burden of OA is increasing due to aging populations and rising obesity rates, yet specific data on OA in India is scarce. Understanding OA's impact in India is essential given its large, diverse population and rising obesity rates. This study aims to provide comprehensive estimates of OA's burden in India, analysing data from 1990 to 2019 to monitor trends and guide interventions. ¹ Dietary shifts and modern lifestyle changes, including irregular sleep patterns and psychological stress, contribute to metabolic disorders like Amavata, similar to rheumatoid arthritis (RA). Ayurvedic literature links Amavata to poor dietary habits and stress, but scientific evidence is limited, prompting further investigation through a case-control study. ² Juvenile idiopathic arthritis (JIA) and rheumatoid arthritis (RA) are significant inflammatory conditions affecting diverse age groups. This study reviews the classification, pathogenesis, and treatment of JIA, focusing on enteritis-related arthritis (ERA) and RA's global burden, including the efficacy in Indian patients compared to other regions.^{3,5}

METHODOLOGY

This study aimed to assess the effect of Mustard Paste on knee joint pain and stiffness among the elderly in the Sangli-Miraj-Kupwad corporation area, employing a quantitative research approach. Utilizing a pre-test post-test control group design, the study involved 62 participants (31 in each group) selected through Simple Random Sampling. The independent variable was Mustard Paste application, while the dependent variables were the levels of knee joint pain and stiffness, measured using the Numerical Pain Rating Scale and the Modified WOMAC scale, respectively. Participants included elderly individuals aged 65-70 years with moderate to severe knee joint pain and stiffness, who provided written consent. Exclusion criteria included mild knee joint pain and stiffness, extreme knee joint stiffness, history of knee joint surgery, and known mustard skin allergies. The pre-test was conducted on the first day for both groups. The experimental group received the Mustard Paste intervention daily for six days, while the control group continued their regular treatment without any additional intervention. A post-test was administered on the sixth day to assess changes in pain and stiffness levels. Ethical considerations were thoroughly addressed, with approval from the Ethical Committee of Bharati Vidyapeeth (Deemed to be University) College

of Nursing, Sangli. Participants were informed about the study's objectives and provided written consent, assured of confidentiality, and their right to withdraw at any time without penalty. The study was designed to ensure no discomfort or risk to participants, with protocols to discontinue the intervention if side effects or allergies occurred. Validity of the research tools was established through content validation, involving feedback from 23 experts in various nursing and medical fields. Based on their suggestions, minor adjustments were made to ensure the tools accurately measured the intended variables. Reliability testing conducted using the inter-rater method yielded high reliability coefficients of 0.85 for the Numerical Pain Rating Scale and 0.95 for the WOMAC scale, indicating the tools were reliable and appropriate for use. A pilot study at UPHC Unit – 05

Vijaynagar assessed the feasibility of the main study. Twenty samples were divided equally between the experimental and control groups. Findings from the pilot study demonstrated a significant reduction in knee joint pain and stiffness levels in the experimental group, confirming the intervention's potential effectiveness. Data collection was conducted in two phases: the pre-intervention phase, where demographic data and clinical profiles were collected, and the intervention phase, where Mustard Paste was applied to the experimental group daily for six days. Pre-test and post-test assessments were conducted on the first and sixth days, respectively. The control group received only their routine treatment without any additional intervention.

RESULTS

Section I: Focuses on the analysis of demographic data pertaining to elderly individuals within the Sangli-Miraj-Kupwad Corporation area, presenting findings in terms of frequency and percentage distributions.

Section II: Involves the examination of data concerning the evaluation of knee joint pain and stiffness levels among the elderly population within the Sangli-Miraj-Kupwad Corporation area, comparing findings between the experimental and control groups, and presenting results in terms of frequency and percentage distributions.

Section III: Deals with analysis of data related to comparison of the level of knee joint pain and stiffness among elderly at selected area of Sangli-Miraj-Kupwad Corporation among experimental and control group in terms of average pre and post-test.

Sr. No.	Variable	Groups	Experimental		Control	
			Frequency	Percentage	Frequency	Percentage
1.	Gender	Male	23	74.19	26	83.87
		Female	8	25.81	5	16.13
2.	Education	Illiterate	8	25.81	2	6.45
		Primary	12	38.71	18	58.06
		Secondary	10	32.26	7	22.58
		Graduation	1	3.23	4	12.90
3.	Occupation	Worker	14	45.16	6	19.35
		Housewife	8	25.81	5	16.13
		Business	1	3.23	2	6.45
		Other	8	25.81	17	54.84

Table 1 Frequency & percentage distribution of elderly people at selected area in terms of frequency and percentage

1. Gender: In the experimental group, 74.19% were males and 25.81% were females, while the control group had 83.87% males and 16.13% females. **2. Education:** In the experimental group, 25.81% were illiterate, 38.71% had primary education, 32.26% had secondary education, and 3.23% were graduates. In the control group, 6.45% were illiterate, 58.06% had primary education, 22.58% had secondary education, and 12.90% were graduates. **3. Occupation:** In the experimental group, 45.16% were workers, 25.81% were housewives, 3.23% were business owners, and 25.81% had other occupations. In the control group, 19.35% were workers, 16.13% were housewives, 6.45% were business owners, and 54.84% had other occupations.

Table No.2 Pre & Post-Assessment Test Level of knee joint pain – Experimental group:

Pain Score	Level of Pain	Pre-Test		Post-Test		Mean	SD
		Frequency	Percentage	Frequency	Percentage		
0	No pain	0	0.00	0	0.00	Pre-Test	Pre-Test

1-3.	Mild	0	0.00	2	6.45	8.93	0.96
4-6.	Moderate	0	0.00	29	93.55	Post-Test 4.22	Post-Test 0.56
7-10.	Severe	31	100.00	0	0.00		

Pre-Test: In the experimental group from Sangli-Miraj-Kupwad Corporation, 100% of the elderly participants had severe knee joint pain. The average pain score was 8.93 (SD = 0.96), ranging from 7 to 10. **Post-Test:** After the intervention, 6.45% of participants reported mild pain, 93.55% had moderate pain, and none had severe pain. The average post-test pain score was 4.22 (SD = 0.56), with scores ranging from 3 to 5.

Table No.3 Pre & Post-test Assessment Level of knee joint pain – Control group

Pain Score	Pain Groups	Pre-Test		Post-Test		Mean	SD
		Frequency	Percentage	Frequency	Percentage		
0	No pain	0	0.00	0	0.00	Pre-Test 9.54	Pre-Test 0.51
1-3.	Mild	0	0.00	0	0.00		
4-6.	Moderate	0	0.00	0	0.00	Post-Test 7.38	Post-Test 0.55
7-10.	Severe	31	100.00	31	100.00		

Pre-Test: In the control group, 100% of elderly participants had severe knee joint pain with an average pain score of 9.54 (SD = 0.51), ranging from 9 to 10. **Post-Test:** Post-intervention, 100% of the control group still had severe pain with an average pain score of 7.38 (SD = 0.55), ranging from 7 to 9.

Table No.4 Pre & Post-test assessments of level of stiffness – Experimental group

Pain Score	Level of Stiffness	Pre-Test		Post-Test		Mean	SD
		Frequency	Percentage	Frequency	Percentage		
0	None	0	0.00	0	0.00	Pre-Test 5.8	Pre-Test 0.48
1-2.	Mild	0	0.00	8	25.81		
3-4.	Moderate	1	3.23	23	74.19	Post-Test 2.83	Post-Test 0.68
5-6.	Severe	30	96.77	0	0.00		

Pre-Test: In the experimental group, none of the elderly participants had mild stiffness, 3.23% had moderate stiffness, and 96.77% had severe stiffness. The average stiffness score was 5.80 (SD = 0.48), ranging from 4 to 6. **Post-Test:** After the intervention, 25.81% of participants had mild stiffness, 74.19% had moderate stiffness, and none had severe stiffness. The average stiffness score was 2.83 (SD = 0.68), ranging from 1 to 4.

Table No.5 Test Comparison of the level of stiffness – Experimental vs Control

Test	Groups	Mean	S.D.	t value	P value
Post Test	Experimental	2.83	0.68	12.50	0.000
	Control	4.80	0.54		

an unpaired t-test compared post-test mean stiffness levels. The experimental group's average score was 2.83 (SD = 0.68), while the control group's average score was 4.80 (SD = 0.54). The t-test value was 12.50 with a p-value of 0.000, indicating a significant difference. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted, showing a significant difference in stiffness levels between the experimental and control groups among the elderly in the selected area.

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