



# EFFECTIVENESS OF MUSTARD PLASTER APPLICATION ON KNEE JOINT PAIN AMONG ELDERLY IN SELECTED RURAL AREAS, HOSHIARPUR, PUNJAB.

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**Abstract: Introduction:** Ageing is the natural process, Old age is a crucial phase where the physiological, psychological and socio-cultural changes take place. The majority of older people in India suffer from knee pain, 95% of them are under 85 years of age. Among these 87% have acute diseases and 96% have chronic diseases. Knee pain can be the result of an injury or pathology of the knee joint. The aim of the present study was to assess the effectiveness of mustard plaster on knee joint pain among elderly in selected rural areas at Hoshiarpur, Punjab. **Methods:** Quasi-experimental research design i.e. non randomized control group design and purposive sampling technique was used to select elderly (= 60 years of age) who had knee joint pain in a selected rural area of Hoshiarpur, Punjab. Modified KOOS pain assessment scale was used to assess the level of pain experienced by the elderly. Among experimental group Mustard powder 20gram with 40gm of wheat flour was mixed in Luke warm water and the paste was spread over a flannel cloth which was double folded and then applied to the knee joint for 7 days. A hot water bottle (1100 F) was placed on the mustard plaster to apply heat to the knee joint. the post test was conducted after the completion of 7 days of topical application of mustard plaster by using modified KOOS pain assessment scale. For control Group regular practice of the participants were encouraged. **Results:** In experimental group, during pretest, 63% elderly were having moderate knee joint pain, 27% were having mild knee joint pain and 10% were having severe knee joint pain. During posttest 47% elderly were having mild knee joint pain and 40% were having moderate knee joint pain, 7% were having no knee joint pain and 6% were having severe knee joint pain. While in control group, in the pretest, 67% elderly were having moderate knee joint pain, 20% were having mild knee joint pain and 13% were having severe knee joint pain whereas during posttest, 63% elderly were having moderate knee joint pain, 23% were having mild knee joint pain and 14% were having severe knee joint pain. There was statistically significant reduction in mean knee joint pain score in experimental group i.e. 8.53 as compared to control group i.e. 12.96 at  $p < 0.05$  level of significance.

**Index Terms** – Knee Joint Pain, Old Age, KOOS pain assessment Scale, Mustard Plaster.

## I. INTRODUCTION

Ageing is the natural process. Old age is a crucial phase where the physiological, psychological and socio-cultural changes take place. Currently there are 580 million senior citizens worldwide and 355 million of these live in developed countries; and life expectancy at birth has increased from 41 years in the early 50s to 62 years in 1990. In the year 2020, life expectancy has become decisive for health due to social life effects and health care system. There are 81 million elderly people in India. The majority of older people in India suffer from knee pain, 95% of them are under 85 years of age. Among these 87% have acute diseases and 96% have chronic diseases. Knee pain can be the result of an injury or pathology of the knee joint.

Knee pain can also occur from diseases or conditions like obesity, constant weight bearing etc involving the soft tissues and bones surrounding the knee and the nerves that supply sensation to the knee area. In fact, the knee joint is the joint most commonly involved in rheumatic diseases, rheumatoid arthritis, reactive arthritis, systemic lupus erythematosus and osteoarthritis.

In order to manage pain & the functional disability various treatment modalities are used. The pharmacological management varies from administering acetaminophen, NSAID drugs, and steroids to weak opioids. Under one umbrella of non-pharmacological measures are rest, joint protection by assistive devices such as cane, weight reduction programme, exercise, external application of oil, mustard plaster, heat and cold application. Diet has major role in prevention of joint pain. Practices like intake of calcium, vitamin D and milk, vitamin A, C, magnesium, zinc in green leafy vegetables helps very well.

India being agriculture based country; people over here widely use mustard. They use it starting from cooking to external application. It is available easily and readily. It is naturally occurring plant product which has anti-fungal, anti-microbial, counter irritant, anti-congestant properties. Elderly in our country are not interested to spend more money for their health especially in rural parts. Mustard can be beneficial to such elderly where they need not to be dependent economically on present generation.

Mustard is one of the oldest recorded spices according to records dating back to 3000BC. It was recognized both for its therapeutic value and condiment value, historically being used to treat scorpion bites, entomb kings and as a flavoring agent to disguise degraded food. Mustard is used as an emetic, and diuretic, as well as a topical treatment for inflammatory conditions such as arthritis and rheumatism.

The aim of the present study was to assess the effectiveness of mustard plaster on knee joint pain among elderly in selected rural areas at Hoshiarpur, Punjab.

## II. OBJECTIVES

1. To assess the level of knee joint pain among elderly in experimental and control group.
2. To compare the level of knee joint pain among elderly in experimental and control group.
3. To find out the relationship of knee joint pain among elderly in experimental and control group with selected demographic variables.

## III. METHODOLOGY

### 3.1 Research Approach

A quantitative research approach was considered to be appropriate by keeping in view the nature of problem and was used to assess the effectiveness of mustard plaster application on knee joint pain.

### 3.2 Research design

Quasi-experimental research design i.e. non randomized control group design was used to assess the effectiveness of mustard plaster application on knee joint pain.

### 3.3 Target Population

Elderly (= 60 years of age) who had knee joint pain in a selected rural area of Hoshiarpur, Punjab.

### 3.4 Sample and Sampling Technique

Elderly clients from selected rural areas of Hoshiarpur were screened for knee joint pain with the help of modified KOOS pain assessment scale. Then, a sample of 60 clients with knee joint pain was selected by purposive sampling technique, out of which 30 were assigned to the experimental group and 30 were assigned to the control group by lottery method.

### 3.5 Tool :

Modified KOOS pain assessment scale was used to assess the level of pain experienced by the elderly. No. of items were 9 and the rating ranged from no pain to extreme pain (0 – 36). 0 was given for no pain and 4 score was given for extreme pain. Thus the total score ranged from 0-36.

### 3.6 Data Collection Process

The procedure of data collection was carried out in the month of the February 2019 to March 2019 after written permission was obtained from authorities of the community for the conduction of study. Elderly were screened for knee joint pain with the help of modified KOOS pain assessment scale. Then the sample was divided into experimental and control group. Then, the level of pain was assessed in experimental and control group by using modified KOOS pain assessment scale. For the experimental group, Mustard powder 20gram with 40gm of wheat flour was mixed in Luke warm water and the paste was spread over a flannel cloth which was double folded and then applied to the knee joint for 15 minutes for the duration of 7 days. A hot water bottle (1100F) was placed on the mustard plaster to apply heat to the knee joint. The post test was conducted after the completion of 7 days of topical application of mustard plaster by using modified KOOS pain assessment scale.

### 3.7 Conceptual Frame Work

Conceptual model of the present study was based on general system theory by Ludwig Von Bertalanffy (1968). This theory describes about Input, Throughput, Output and Feedback

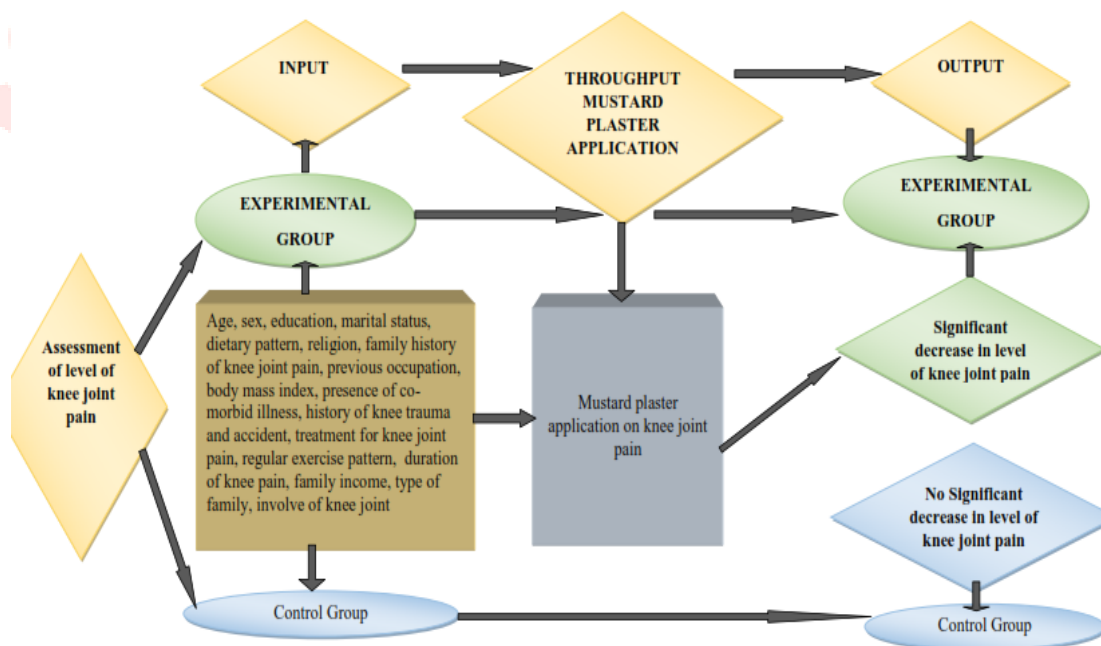


Fig 1 : Modified General System Model (Ludwig Von Bertalanffy, 1968)

## IV. RESULTS

Frequency and Percentage distribution of elderly with knee joint pain in experimental and control group according to demographic variables.

N-60

Demographic variable	Experimental group (n=30)		Control group (n=30)		Df	$\chi^2$
	n	%	n	%		
<b>1) Age (in years)</b>						
a) 60-69	16	53	18	60	2	0.36 <sup>NS</sup>
b) 70-79	11	37	10	34		
c) 80-89	3	10	2	6		
d) 90 & above	-	-	-	-		
<b>2) Sex</b>						
a) Male	9	30	12	40	1	0.66 <sup>NS</sup>
b) Female	21	70	18	60		
<b>3) Educational Status</b>						
a) Illiterate	8	27	3	10	4	6.41 <sup>NS</sup>
b) Primary	11	36	13	43		
c) Secondary	8	27	7	24		
d) Higher secondary	1	3	6	20		
e) Graduation & above	2	7	1	3		
<b>4) Marital Status</b>						
a) Married	22	73	26	87	3	1.66 <sup>NS</sup>
b) Widow/ widower	8	27	0	0		
c) Unmarried	0	0	0	0		
d) Divorced	0	0	4	13		
<b>5) Dietary Pattern</b>						
a) Vegetarian	22	73	16	53	2	3.75 <sup>NS</sup>
b) Non Vegetarian	8	27	12	40		
c) Eggetarian	0	0	2	7		
<b>6) Religion</b>						
a) Sikh	22	73	27	90	1	2.78 <sup>NS</sup>
b) Hindu	8	27	3	10		
c) Christian	-	-	-	-		
d) Muslim	-	-	-	-		
<b>7) Family history of knee joint pain</b>						
a) Yes	13	43	9	30	1	1.76 <sup>NS</sup>
b) No	17	57	21	70		
<b>8) Previous occupation</b>						
a) Government job	3	10	5	17	4	5.99 <sup>NS</sup>
b) Private job	1	3	6	20		
c) House wife/ Non working	23	77	16	53		
d) Business	1	3	2	7		

Demographic variable	Experimental group (n=30)		Control group (n=30)		Df	$\chi^2$
	n	%	n	%		
e) Agriculture	2	7	1	3		
<b>9) Body mass index</b>						
a) Under weight	1	3	2	7	3	1.76 <sup>NS</sup>
b) Normal	11	37	15	50		
c) Over weight	15	50	11	37		
d) Obese	3	10	2	6		
<b>10) Presence of co-morbid illness</b>						
a) Cardiovascular disease	1	3	2	7	4	3.54 <sup>NS</sup>
b) Diabetic mellitus	4	13	7	23		
c) Hypertension	8	27	9	30		
d) Others	2	7	0	0		
e) Nil	15	50	12	40		
<b>11) History of knee trauma/ accident</b>						
a) Yes	5	17	3	10	1	0.57 <sup>NS</sup>
b) No	25	83	27	90		
<b>12) Treatment for knee joint pain</b>						
a) Topical application	4	13	1	3	3	10.9*
b) Home based remedies	10	33	16	54		
c) Oral analgesics	7	24	12	40		
d) Parental analgesics	9	30	0	0		
e) Nil	0	0	1	3		
<b>13) Regular exercise pattern</b>						
a) Walking	18	60	25	83	2	4.42 <sup>NS</sup>
b) Cycling	7	23	2	7		
c) None	5	17	3	10		
<b>14) Duration of knee pain (in years)</b>						
a) <5	21	70	11	37	3	8.62*
b) 6-10	7	24	17	56		
c) 11-15	1	3	2	7		
d) More then 15	1	3	0	0		
<b>15) Family income(₹) per month</b>						
a) <10,000	3	10	13	43	2	10.95*
b) 10,001-20,000	16	53	14	47		
c) 20,001-30,000	11	37	3	10		
d) >30,000	0	0	0	0		
<b>16) Family type</b>						
a) Nuclear	7	23	11	37	1	1.27 <sup>NS</sup>
b) Joint	23	77	19	63		
c) Extended	0	0	0	0		

Demographic variable	Experimental group (n=30)		Control group (n=30)		Df	$\chi^2$
	n	%	n	%		
	<b>17) Involve of knee joint</b>					
a) Right	5	17	8	27	1	1.27 <sup>NS</sup>
b) Left	9	30	4	13		
c) Both	16	53	18	60		

NS= non significant      \* = significant at p<0.05

**Comparison of pre-test and post-test mean score among elderly with knee joint pain in experimental group and control group. N=60**

Level of knee joint pain	n	Pre test		Post test		Df	't' value
		Mean Score	SD	Mean Score	SD		
Experimental group	30	12.53	4.300	8.53	4.800	58	3.40*
Control group	30	13.7	3.860	12.96	3.652	58	0.76 <sup>NS</sup>
		df=58		df=58			
		't'=1.10 <sup>NS</sup>		't'=4.02*			

\* = at p<0.05 level of significance      NS=significant

The results depict that the comparison of pre-test and post-test mean score of level of knee joint pain among elderly in experimental group and control group. In experimental group, pre-test mean knee joint pain level score was 12.53 and in control group pre-test mean knee joint pain score was 13.7. The difference between pre-test mean knee joint pain level scores in experimental and control group was statistically non significant at p<0.05 level of significance. During post test in experimental group mean knee joint pain level score was 8.53 and in control group 12.96. The difference between post-test mean knee joint pain level score in experimental and control group was statistically significant at 0.05 level of significance.

The relationship of knee joint pain among elderly in experimental and control group with selected demographic variables. According to age, in experimental group the mean score were highest i.e. 10.33 in age group of 80-89 and 60-69 years of age followed by 9.06, 7.27 among in age group of above 70-79 respectively. In control group the mean score were highest i.e. 18.43 in age group of 60-69 and 15.32, followed by 70-79, 14.00 among in age group of above 80-89 respectively. The difference in knee joint pain in experimental and control group was found statistically non-significant at p< 0.05 level.

## V. CONCLUSION

In experimental group, during pre-test 63% elderly were having moderate knee joint pain, 27% were having mild knee joint pain and 10% were having severe knee joint pain. During post-test 47% elderly were having mild knee joint pain and 40% were having moderate knee joint pain, 7% were having no knee joint pain and 6% were having severe knee joint pain. While in control group, in the pre-test, 67% elderly were having moderate knee joint pain, 20% were having mild knee joint pain and 13% were having severe knee joint pain whereas during post-test, 63% elderly were having moderate knee joint pain, 23% were having mild knee joint pain and 14% were having severe knee joint pain. There was statistically significant reduction in mean knee joint pain score in experimental group i.e. 8.53 as compared to control group i.e. 12.96 at p<0.05 level of significance. Thus, it was concluded that there was definite impact of mustard plaster application on knee joint pain among elderly.

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