



EFFECTIVENESS OF CRYOTHERAPY ON PAIN AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED HOSPITAL, DEHRADUN.

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Abstract : Pain is a multi-dimensional phenomenon. Management of pain includes pharmacological and non-pharmacological approaches. Knee Osteoarthritis is a degenerative joint disease, is slowly and progressive, non-inflammatory disorder of moveable joint, particularly weight bearing articulation. This is characterized by loss of articular cartilage in articulating joint and hypertrophy of the bones at the articular margins. The damage from osteoarthritis is confined to the joints and surroundings tissue. This is leading cause of pain and disability in elderly person. Weight bearing joints (hips and knees), hands and the vertebral column are most often affected. More than 5 million adults report having osteoarthritis in a knee joint, with pain, swelling, and stiffness, and >75% of these people are women. India is likely to notice an endemic of osteoarthritis with about 80% of the 65+ population in the country suffering with wear and tear of joints. 40% of these people are likely to suffer from severe osteoarthritis, which will disable them from daily activities, say the experts quoting the world health organization (WHO). AIM: To assess effectiveness of cryotherapy on pain among patients with knee osteoarthritis in selected hospital of Dehradun, Uttarakhand. MATERIAL & METHOD: The quantitative approach and pre-experimental design with one group pre-test post-test design was used. Purposive sampling technique was used to collect 60 knee osteoarthritis patients who met the inclusion criteria from the selected hospital. The conceptual framework of the research was based on Modified Imogene king's Goal attainment theory model. The population of patients was in the age group of 45- <74 years with knee osteoarthritis pain. Descriptive and inferential statistics were used to analyze the data and to test the study hypothesis. RESULT: At pretest level majority of the patients 30 (50%) had mild pain while at the post test level majority of the patients 28 (46.7%) had no pain. "t" value= 18.984 shows the significantly difference between the pre-test and post test level of knee osteoarthritis pain. Chi-square value shows no significant association between the demographic variables and pretest level of knee osteoarthritis pain.

CONCLUSION: From the result of the study, the overall findings of the study clearly showed the application of cryotherapy procedure was significantly effective in reducing the pain among the patients with knee osteoarthritis.

KEYWORDS: To Assess; Pain; application of cryotherapy, knee osteoarthritis patients and its pain management.

INTRODUCTION:

Osteoarthritis also referred to as osteoarthrosis could be a degenerative joint disease. Aetiology is multifactorial, and still not understood. Commonly it's thought to be wear and tear of joints in concert ages. Two varieties of osteoarthritis are recognized – primary and secondary. Primary Osteoarthritis occurs during a joint. It occurs in adulthood, mainly within the weight bearing joints (knee and hip). In a very generalized variety, the trapezio-metacarpal joints of the fingers also are affected. Primary osteoarthritis is commoner than secondary osteoarthritis. Secondary Osteoarthritis, there's an underlying primary disease of the joint which ends up in degeneration of the joint, often a few years later. It's going to occur at any age after adolescence, and occurs commonly at hip. Predisposing factors are congenital mal-development of a joint, irregularity of the joint surfaces from previous trauma, previous disease producing a damaged articular surface, internal derangement of the knee, like a loose body, mal-alignment (bow legs etc.) and obesity and excessive weight. Knee osteoarthritis is that the occurrence of osteoarthritis within the ginglymus. Osteoarthritis involves the degradation of joints, including articular cartilage and sub-chondral bone. Also, ligaments, the capsule and also the tissue layer degenerate. This may eventually cause pain and loss of function. Clinical presentation of knee osteoarthritis is pain at beginning of the movement, in a while pain during movement and eventually permanent pain. These patients also will experience a loss of function like stiffness, decreased range of motion (ROM) and impairment in everyday activities. Other possible characteristics of knee Osteoarthritis are enlargement of bone, crepitus, joint-line tenderness and elevated sensitivity to cold and/or damp. The pathogenesis of knee Osteoarthritis are linked to biomechanical and biochemical changes within the cartilage of the genu. (Kirstin Uth et al, 2014). The cartilage ensures that the bone surfaces can move painless and with low friction to every other. In OA, the cartilage decreases in thickness and quality, it becomes thinner and softer, cracks may occur and it'll eventually crumble off. Cartilage that has been damaged, cannot recover. Finally the cartilage will disappear. The bone surfaces may also be affected, the bone will expand and spurs (osteophytes) will develop.

Cryotherapy could be a treatment within which the patients are exposed to extreme cold for brief duration. The term “Cryotherapy” Comes from Greek word cryo means cure. Cryotherapy, also referred to as ice application, is that the simplest and oldest thanks to treat injuries. Its use is worldwide spread thanks to its effectiveness, convenience low cost and simple transportation. Ice is believed to regulate pain by instigating anesthesia. It also decreases edema, nerve conduction velocities, cellular metabolism and native blood flow. The effect of the cryotherapy depends on the strategy, the duration, the temperature of the ice and therefore the depth of the subcutaneous fat. Immediate effect of skin cooling and analgesia last for five minutes but the discharge of endorphins can have lasting effect, where the pains and signs of inflammation are found suppressed for weeks.

NEED & BACKGROUND OF STUDY

Knee Osteoarthritis is that the most typical type of arthritis and a number one reason for disability worldwide, largely because of pain, the first symptom of the disease. The pain experience in knee Osteoarthritis specifically is well-recognized as typically transitioning from intermittent weight-bearing pain to a more persistent, chronic pain. Osteoarthritis may be a leading reason for disability in older adults within the U.S. Approximately 33% of yank adults report some reasonably arthritis or chronic joint symptoms. The incidence increases with age and is higher in women than in men. More than 5 million adults report having osteoarthritis in a very ginglymus, with pain, swelling, and stiffness, and >75% of those people are women. Although risk factors for prevalence of Osteoarthritis are well studied in

Caucasian populations, little data are available in Asian populations. Asia is where the aging of population will impose a major skeletal burden within the future. The proportion of individuals aged 65 years and older in Asia is estimated to extend from ~7% in 2008 to 16% in 2040 .¹⁹In a recent review, it's concluded that the prevalence Knee Osteoarthritis or knee pain is as high as or over other Caucasian populations. India is probably going to note a virus of osteoarthritis with about 80% of the 65+ population within the country suffering with wear and tear of joints. 40% of those people are likely to suffer from severe osteoarthritis, which is able to disable them from daily activities, say the experts quoting the globe health organization (WHO). The prevalence of osteoarthritis among elderly is almost about 56.6%. Community survey data in rural and concrete areas of India shows the prevalence of Osteoarthritis to be within the range of 17% to 60.6%. In India the crude prevalence of clinically-diagnosed knee Osteoarthritis was higher within the urban (5.5%) than the agricultural community (3.3%). After adjusting for age and sex distribution the prevalence was higher in rural communities. A study to search out the prevalence of Knee Osteoarthritis within the Indian population and factors related to it had been conducted in (Jun-Nov 2013) shows incidence of Knee Osteoarthritis in Uttarakhand, Dehradun was 27.2%. Since knee osteoarthritis incidence is increasing day by day and main predominant symptoms is pain.

STATEMENT OF PROBLEM

A STUDY TO ASSESS THE EFFECTIVENESS OF CRYOTHERAPY ON PAIN AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED HOSPITALS OF DEHRADUN DISTRICT, UTTARAKHAND.

OBJECTIVES OF THE STUDY

- 1) To assess the pretest level of pain among the patients with knee osteoarthritis before cryotherapy.
- 2) To assess the effectiveness of cryotherapy on pain among patient with knee osteoarthritis
- 3) To determine the association between the pretest level of pain among the patients with knee osteoarthritis with their selected demographic variables.

HYPOTHESIS

H1: There will be a significant difference between post-test level of pain score and pretest level of pain score.

H2: There will be significant association between the pretest level of pain of knee osteoarthritis patients with

their selected demographic variables.

MATERIAL & METHOD

The quantitative approach and Pre-experimental design with one group pre-test -post-test design was used. Purposive sampling technique was used to collect the 60 patients with knee osteoarthritis. The study was collected in param orthopedic hospital at Dehradun, Uttarakhand. The patient with knee osteoarthritis who were willing to participate in the study, present at the time of data collection were included in the study. The investigator had collected the data after getting permission from the authority and approval was obtained to conduct the study. The participants were informed about the purpose of the study and written consent was

taken from the participants. Pre-test were done by using demographic perform and assess the level of pain among patients with Knee Osteoarthritis by using Pain Numerical Rating Scale. After the pretest, Cryotherapy application was given for 10 minutes. At the end of the therapy the subjects were assessed again for pain perception using the research tool.

Descriptive statistics include frequency, percentage, mean and standard deviation was used to describe the result. Inferential statics like paired t-test, Chi-square were used to find the effectiveness and association.

RESULTS:

SECTION-A

Table-1

FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES AMONG STUDY GROUP.

N = 60

S. No.	Demographic Variables	Frequency	Percentage
1.	Age in years		
1.1	45 – 54	21	35.0%
1.2	55 – 64	19	31.7%
1.3	65 – 74	15	25.0%
1.4	> 75	5	8.3%
2.	Gender		
2.1	Male	32	53.3%
2.2	Female	28	46.7%
3.	Religion		
3.1	Hindu	4	57.70%
3.2	Muslim	34	15.0%
3.3	Christian	9	6.70%
3.4	Others	13	21.70%
4.	Educational status		
4.1	Illiterate	07	11.7%
4.2	Elementary education	06	10.0%
4.3	Primary education	05	8.3%
4.4	High school	19	31.7%
4.5	Graduate	23	38.3%
5.	Occupational status		
5.1	Self employee	14	23.3%
5.2	Government employee	7	11.7%
5.3	Private employee	19	31.7%
5.4	Unemployee	20	33.3%
6.	Income		
6.1	Below Rs. 5,000/-	1	1.7%
6.2	Rs.5,001- Rs.10,000/-	4	6.7%
6.3	Rs.10,001-Rs.15,000/-	11	18.3%
6.4	Above Rs.15,000	24	40.0%
6.5	Not specified	20	33.3s%
7.	Dietary Pattern		
7.1	Vegetarian	24	40%
7.2	Non vegetarian	36	60%
8.	Past History of knee oa		
8.1	Hereditary	25	41.7%
8.2	Ageing	13	21.7%
8.3	Obesity	19	31.7%
8.4	Diet	3	5.0%
9.	Sources of Information		
9.1	Medical Professional	41	68.3%
9.2	Mass Media	9	15.0%
9.3	Books	10	16.7%
10.	Duration of illness		
10.1	1-5 years	34	56.7%
10.2	6-10 years	19	31.7%
10.3	11-15 years	6	10.0%
10.4	>15 years	1	1.7%
11.	Duration of Treatment		
11.1	1-5 years	34	56.7%

11.2	6-10 years	19	31.7%
11.3	11-15 years	6	10.0%
11.4	>15 years	1	1.7%

SECTION-B

TABLE 2

DISTRIBUTION OF LEVEL OF KNEE OSTEOARTHRITIS PAIN IN PRE AND POST-TEST AMONG STUDY GROUP

N = 60

S.No.	knee osteoarthritis pain numerical rating scale	Study group			
		Pre-test		Post-test	
		Knee osteoarthritis pain		Knee osteoarthritis pain	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1.	0	18	30.0%	28	46.7%
2.	1	30	50.0%	25	41.7%
3.	2	9	15.0%	7	11.6%
4.	3	3	5%	0	0.00%
5	4	0	0%	0	0%

SECTION-C:

Table 3

Comparison of pre - test and post- test knee osteoarthritis pain within study group

N = 60

S.NO.	Level of knee osteoarthritis pain	Study group		
		Mean	Standard Deviation	Paired "t" value & "p" value
1.	Pre knee osteoarthritis Pain	1.95	.811	"t" value= 18.984 "p" value= .000
2.	Post knee osteoarthritis Pain	.65	.685	

SECTION –D:

Table 4: Association of demographic variables with the level of knee osteoarthritis in pre- testamong the study group

S. No.	Demographic Variable	PNRS 0	PNRS 1	PNRS 2	PNRS 3	Chi Square Value	d.f.	Inference
1.	Age					12.300a	9	N.S.
	45-54	8	9	3	1			
	55-64	9	8	2	0			
	65-74	0	10	3	2			
	>74	1	3	1	0			
2.	Gender					6.786a	3	N.S.
	Male	7	19	6	0			
	Female	11	11	3	3			
3.	Religion					5.440a	9	N.S.
	Hindu	10	17	4	3			
	Muslim	2	5	2	0			
	Christian	1	3	0	0			
	Others	5	5	3	0			
4.	Education					7.197a	12	N.S.
	Illiterate	2	3	1	1			
	Elementary Education	2	3	1	0			
	Primary Education	2	2	0	1			
	High School	6	11	2	0			
	Graduate	6	11	5	1			
5.	Occupation					6.999a	9	N.S.
	Self- employed	3	8	3	0			
	Govt. Employee	1	5	1	0			
	Private Employee	5	10	3	1			
	Unemployed	9	7	2	2			
6.	Income					16.125a	12	N.S.
	>5000	0	0	1	0			
	5001-10000	0	4	0	0			
	10001-15000	3	6	1	1			
	<15000	6	13	5	0			
	Not Specified	9	7	2	2			
7.	Diet					1.343a	3	N.S.
	Veg.	8	11	3	2			
	Non veg.	10	19	6	1			
8.	Past History of knee OA					8.689a	9	N.S.
	Hereditary	8	13	4	0			
	Ageing	2	8	1	2			
	Obesity	6	8	4	1			
	Diet	2	1	0	0			
9.	Source of Information					1.724a	6	N.S.
	Medical Professional	13	20	6	2			
	Mass Media	2	5	1	1			
	Books	3	5	2	0			
10.	Duration of Illness					13.142a	9	N.S.
	1-5 Years	13	14	5	2			
	6-10 Years	5	10	3	1			
	11-15 Years	0	6	0	0			
	>15 Years	0	0	1	0			
11.	Duration of Treatment					13.142a	9	N.S.
	1-5 Years	13	14	5	2			
	6-10 Years	5	10	3	1			
	11-15 Years	0	6	0	0			
	>15 Years	0	0	1	0			

* Statistically significant at $p < 0.05$ SS – Statistically Significant, NS – Not Significant

DISCUSSION:**Major Findings of the study-**

The majority of knee osteoarthritis clients i.e. 35.0% (21) were aged more than 45-54 years, 53.3% clients were male, 56.7% (34) clients were Muslim, 38.3% were graduate, 31.7% (19) were private employee, 40.0% (24) have their income above Rs.15000, 60% (36) were non vegetarian, 41.7% (25) were have hereditary knee osteoarthritis, 68.3% (41) have source of information from medical professional, 56.7% (34) duration of illness of knee osteoarthritis clients were 1-5 years, treatment of knee osteoarthritis clients were 56.7% (1-5) years.

To assess the effectiveness of cryotherapy on pain among patient with knee osteoarthritis.

The pre-test level of pain score before cryotherapy application shows that 18 (30%) patient had no pain, 30 (50%) had mild pain, 9 (15%) had moderate pain, 3 (5%) had severe pain and no one had unbearable pain. After application of cryotherapy the level of pain among patient with knee osteoarthritis shows that 28 (46.7%) patient had no pain, 25 (41.7%) had mild pain, 7 (11.7%) had moderate pain and no patient had severe and unbearable pain.

The paired t test shows that the calculated “t” value i.e 18.984 is higher than the tabulated value at $p < 0.05$ which shows the significant difference between the pre-test and post-test level of pain which shows that the cryotherapy is effective on pain among patient with knee osteoarthritis. Hence, the H_1 is accepted.

To determine the association between the pretest level of pain among the patients with knee osteoarthritis with their selected demographic variables.

The chi-square value shows that there is no significant association between the pre-test level of pain with there any demographic variables.

Hence, the H_2 is rejected and null hypothesis is accepted.

CONCLUSION:

The temporary use of cryotherapy helps to reduce pain and raises the function of patella in the case of knee osteoarthritis. Cryotherapy may be deliberate as a conservative, non-pharmacological alternative treatment for the arthritis patient. Furthermore, the result findings of this study indicate a better example about the effectiveness of cryotherapy on the samples with the knee osteoarthritis and this keep amend exercise invasions and allure lower financial burden worldwide.

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