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Effectiveness of Kneading Technique on Joint Pain Among Old Age People with Osteoarthritis in Selected Old Age Homes at Bhubaneswar

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ABSTRACT

This study aimed to evaluate the effectiveness of Kneading technique on joint pain among old-age people with Osteoarthritis in selected old age homes at Bhubaneswar

Objective: To assess the level of joint pain among old age people with Osteoarthritis before and after the kneading technique, also aims to evaluate the effectiveness of kneading technique on level of joint pain among old age people with osteoarthritis.

Method & Materials: The research design selected for this study was Quasi experimental pre test post test control group design. The investigator opted purposive sampling technique to select a sample of 40 (exprimental-20 and control-20) of old age people with osteoarthritis according to inclusion and exclusion criteria. Those who have no pain sensation, undergone surgery, handicapped or bedridden were excluded from the study. In this study self-structured socio-demographic data tool, Structured Visual analogue scale were used to measure and observe the study accurately. Data was analysed through descriptive and inferential statistics.

Results: After the kneading technique it was remarked that in experimental group 30% samples had no pain, 45% samples had mild pain and 25% samples had moderate pain while in control group 30% samples had mild pain and 70% of the samples had moderate pain. It this study pre-test mean score and SD for the experimental group were 4.35±1.927, and for the post-test it reduced to 2.65±1.814. The difference between the pre-test and post-test mean scores and SD was 1.70 and ±0.801 respectively. It was found to be statistically significant ($p<0.0001$). In the control group, pre-test mean score and SD was 4.35 and ±1.785 respectively in post-test it reduced to 3.25±1.209. The difference in the score is 1.10±2.47. The paired t test value in experimental group is 9.488, in control group 1.993. It was found more than table value with at 0.05 level of significance. The difference was highly significant. Hence the hypothesis is rejected.

Conclusion: This study revealed that Kneading technique was effective in reducing knee joint pain of old age people with osteoarthritis.

Keywords: *Kneading technique, Joint pain, Osteoarthritis, Old age*

1. INTRODUCTION

"For all the happiness mankind can gain not in pleasure but relief from pain" -John Dryden

Osteoarthritis is a very known disease of the joint that mostly affects the middle age to elderly people. It is referred as a "wear and tear" of the joints, although it is more common in old age people, it is not really accurate to say that the joints are just "wearing out," It is characterized by breakdown of the cartilage, changes of the joints, tendons deterioration and ligaments, and various degrees of inflammation in the lining of the joints.[1]

Joint diseases like Osteoarthritis affect millions of people throughout the world, causing pain and disability with great impact on individuals and on society as a whole. Osteoarthritis in the ageing population will generate a global burden of costs and disability. Men are more often affected than women before the age of 50. Women are affected twice as often as men after the age of 50. Elderly patients are most often affected (joint diseases account for half of all chronic conditions in persons aged 65 years and above) and because the number of individuals over the age of 50 years is expected to double worldwide between 1990 and 2020, the global burden of osteoarthritis will increase Drastically.[2] Curative treatment has not been yet found for osteoarthritis and treatment is directed towards symptom relief and preventing of further functional deterioration. Current modes of treatment helps to reduce pain and improve functioning range from information, education, physical therapy and aids, analgesics, non-steroidal anti-inflammatory drugs, joint injections and knee replacement procedures in which all or part of the joint is replaced with plastic, metal or ceramic implants.[3]

Knee pain could also reduce exercise tolerance of people with osteoarthritis. The strength of the knee muscle of the patients with osteoarthritis knee is usually weaker than that in normal subjects. Muscle weakness may in turn interfere with the normal mechanics around the knee joint, thus increasing pain. Pain can also be decrease temporarily reducing the compressive force on the joint, this is accompanied when technique designed to distract the two joint surface are used. Massage technique can improve the stability to the knee joint.[4]

2. MATERIALS AND METHODS

Ethical Considerations:

Approval of research problem and objectives was obtained from the IEC (Instituitional Ethics Committee) KIIMS (KIIT,DTU) Bhubaneswar. Permission was obtained from the higher authority of M.P old-age Home in Bhubaneswar. Confidentiality and Privacy of the participant's information was maintained, it was not disclosed to anybody without informing the participants.

Study design, setting and participants:

Quantitative approach with quasi-experimental (pre test post test control group design) was acquired to test the effect of Kneading technique on level of joint pain among elderly with Osteoarthritis. The present study was carried out in the M.P Old age home and Geriatric Centre of Bhubaneswar, Odisha. People aged 60year and above who able to read and speak odia language were included in the study. Elderly who having no pain sensation, undergone surgery, handicapped or bedridden were excluded from the study. According to inclusion and exclusion criteria a total of 40 elderly (20 in control group and 20 in experimental group) were selected for the study using purposive sampling technique.

Sample size:

Sample size calculation is a crucial issue in a Quantitative research. To determine accurate sample size for my study is not easy for any researcher. The sample size will be determined by using the Cochran's formula:-

Cochran's Formula:-

$N_0 = Z^2pq / e^2$

$= Z^2P(1-P) / e^2$

$= (1.96)^2 \times 0.29 \times (1-0.29) / (0.05)^2$

$= 3.8416 \times 0.29 \times 0.71 / 0.0025$

$= 0.79098 / 0.0025$

$= 316.39$ (round figure 316)

Z= value of Z is find 1.96 for 95% level of confidence

P= Prevalence rate of joint pain with osteoarthritis among old age people in Orissa around 29% (according to Journal of Family medicine and primary care, 2021, Rural Odisha)

q = (1-P)

e = desired level of precision (Margin of error) 5% (0.05)

N_0 = Sample size

Due to Covid pandemic, limited availability of samples and restricted time period for conducting the study, researcher took all samples available (n=40). It came to[control group(n=20), experiment group (n=20)].

Intervention:

A pre-experimental assessment was carried out with a smaller cohort to determine the effectivity , feasibility and clarity of the Kneading technique among old-age with osteoarthritis. Adjustments were made based on participant's need. Pre test was

done by using Visual analogue scale to assess the level of pain among both groups. The intervention was given to the experimental group daily once, with each training session lasting 20 min for time period of 5 days while control group was received their routine care and extra some leaflets containing prevention of joint pain.

After 5 days of intervention period, on 6th day with the help of same tool post test was done for both control and experiment group.

Tools for data collection:

Two tools employed for data collection. Tool-1 is a Self-structured demographic proforma, administered through interviews, which captures baseline characteristics including consists of characteristics of osteoarthritis patients such as age, sex, religion, marital status, educational status source of income , occupational status, preferred diet, activities done presently in a day.

Tool-2 is a structured Visual Analog Scale. The pain VAS is a Standard unidimensional measure of pain intensity, which has been widely used in diverse older populations, including those with

rheumatic diseases. The pain intensity is No Pain (0), Mild Pain (1-3), Moderate Pain (4-6), Severe Pain (7-10), Worst pain (above 10). The content validity and reliability of these tools are meticulously assessed, with content validity verified by seven experts in the field. The reliability value measured by Chronbach alpha for the scale.

Procedure of Data Collection:

Data collection phase was conducted over a 1month period, following the acquisition of ethical clearence and written permissions from Head of the Help-age India Organization, Nayapalli, Bhubaneswar. Purposive sampling technique was used to select samples [n=40] (elderly age 60 and above) from M.P Old-age home and Shri Krishna Ananda Ashram (both group). Samples were divided into two groups control and experiment doing lottery method by researcher. Two settings (old age home) were taken for assigning the subjects, for control group (n=20) and experimental group (n=20). Baseline assessment was done on the 1st day for both group, using visual analog scale observed level of joint pain among both group. Hence control group was received their routine care and experimental group received Kneading technique, a manipulation in which muscles and subcutaneous tissues are alternatively compressed and released. The movement was performed in a circular motion which is divided into two phases pressure and release. Applied pressure over the tissue. During the pressure phase of each stroke, the hands and skin moved together on the deeper structure and during the release phase, the hand glided smoothly over the skin. The pressure phase and release phase completed with in 3-4 seconds. Information were collected by interview schedule and data analysis was done by using descriptive and inferential statistics with SPSS version 21.

Statistical Analysis:

Data obtained was analyzed in terms of objectives and by using both descriptive and inferential statistics. Collected Data was coded and computed into Microsoft Excel and then analyzed using SPSS Version 26 (IBM SPSS Statistical for windows, version 26.0. Armonk, NY, USA; Corp.) Socio-demographic data of elderly was analysed by using descriptive statistics. (Frequency, percentage). Effect of Kneading technique was analyzed by using inferential statistical method like Paired and Unpaired t-test. Using inferential statistic association between level of joint pain among old age people with their selected socio demographic variables were analyzed in both group

3. RESULTS

SECTION-I

Findings related to description of the study samples according to socio-demographic variables:

- The study revealed that there was 30% of experimental Group participants and 70% of Control Group participants belonging to the age group of 60- 70 years. In the 70 to 80 years group, there were 70% participants in experimental Group and 50% in Control Group.
- It was seen that there was 35% male participants in both Experimental Group and Control Group and 65% female participants in both the groups.
- The study also depicted that there was 50% married participants in both experimental Group and Control Group. There were 35% widow population in Experimental Group and 30% in Control Group. Only 5% of the population was unmarried in both the group. There were 10% divorcee in the experimental group and 15% in the control group
- The study revealed that there was 45% of experimental Group participants and 35% of Control Group participants had primary education. There were 25% population in experimental Group with no formal education and 15% in Control Group. Only 5% of the population in Experimental Group and 15% in Control Group were graduates. There were no post graduates in any of the groups.
- It was seen that there was 80% of Experimental Group participants and 70% of Control Group participants had no

income. There were 5% population in Experimental Group with pension and 15% in Control Group. Only 15% of the population in experimental Group and Control Group had separate sources on income. None of the participants earned through their children.

- The study also presented that 80% of Experimental Group participants and 55% of Control Group participants were unemployed. There were 20% population in Experimental Group and 45% in Control Group who were employed.
- It was seen that majority of the population was Hindu (40% in Experimental group and 50% in Control Group), 35% of experimental Group population was Muslim (35%), and 25% of Control Group. 15% in both the groups were Christian. There were 10% population who belonged to other religion.
- It was seen that there was 35% vegetarian in Experimental Group and 20% in Control Group. 65% of the experimental group and 80% of the Control Group population consumed non-vegetarian diet.

SECTION II

Assessment of pre-test and post-test level of joint pain among experimental and control group

A. Pre-test level of Joint pain

Table 1.1: Pre-test pain classification among the two groups

Pain Classification	EXP.GROUP		CONTROL GROUP		Chi Square value	P Value
	No.	Percentage	No.	Percentage		
No Pain	0	0	0	0	21.800	<0.0001*
Mild Pain	8	40.0	4	20.0		
Moderate Pain	10	50.0	16	80.0		
Severe Pain	2	10.0	0	0		
Worst Pain	0	0	0	0		
Total	20	100.0	20	100.0		

***statistically significant** **N=40**

Table 1.1 shows that the pre-test pain scores were classified as No pain, Mild pain, Moderate pain, severe pain and Worst pain. It was seen that 20% of population in Control Group and 40% in Experimental Group had mild pain. In Control Group, 80% of the population and 50% of population in experimental group had moderate pain . Only 10% of them had severe pain in experimental Group

B. Post-test level of Joint pain

Table 1.2: Post-test pain classification among the two groups

Pain Classification	EXP. GROUP		CONTROLGROUP		Chi Square value	P Value
	No.	Percentage	No.	Percentage		
No Pain	6	30.0	0	0	13.560	0.001*
Mild Pain	9	45.0	6	30.0		
Moderate Pain	5	25.0	14	70.0		
Severe Pain	0	0	0	0		
Worst Pain	0	0	0	0		
Total	20	100.0	20	100.0		

***statistically significant** **N=40**

Table 1.2 shows that the post-test pain scores were classified as No pain, Mild pain, Moderate pain, severe pain and Worst pain. It was revealed that 30 % of population in the experimental group had no pain,30% of population in Control Group and 45% of population in experimental Group had mild pain. In Control Group, 70% of the population and 25% of population in experimental group had moderate pain. There were none who reported to have severe and worst pain in the both experimental and Control Group .

SECTION -III

Evaluation of effectiveness of Kneading technique on level of joint pain among experimental and control group.

Table 2: The mean score comparison for the pre and post test intervention

Group N=40		**Mean±SD**	**Mean Diff**	**Std. Error Mean**	**T Value**	**P Value**	**95% Confidence Interval of the Difference**	
							Lower	**Upper**
EXP . Group N=20	Pre test	4.35±1.927	1.70±0.801	0.431	9.488	<0.0001*	1.325	2.075
	Post test	2.65±1.814		0.406				
Control Group N=20	Pre test	4.35±1.785	1.10±2.47	0.399	1.993	0.061	-.055	2.255
	Post test	3.25±1.209		0.270				

***Statistically significant** **N=40**

Table 2. shows the mean scores for both the groups. It was presented that the mean score for the Experimental group pre-test was 4.35±1.927, and in post test it reduced to 2.65±1.814. The paired t test value in experimental group is 9.488. The difference between the pre-test and post-test mean scores were found to be statistically significant ($p<0.0001$). In the control group, the mean score in pre-test was 4.35±1.785 and in post-test it reduced to 3.25±1.209. The paired t test value in control group 1.993. Although improvement in both the groups was seen, better performance was noted for the Experimental group. A strong correlation was seen between the pre-test and post-test scores in both the groups. The mean difference for the experimental group was 1.70±0.801 and control group was 1.10±2.47.

SECTION-IV

Association between pre-test level of joint pain among old age people with osteoarthritis and their selected socio demographic variables.

Table 3.: Association between the demographic variables and pre-test mean scores of joint pain

Characteristics	Category	Pre Test Pain Level						Chi Square value	P value
		Mild Pain		Moderate pain		Severe Pain			
		NO	%	NO	%	NO	%		
AGE	60 to 70 years	9	75.0	7	26.9	0	0	9.078	0.011*
	71 to 80 years	3	25.0	19	73.1	2	100.0		
Gender	Male	4	33.3	9	34.6	1	50.0	0.901	1.000
	Female	8	66.7	17	65.4	1	50.0		
	Transgender	0	0	0	0	0	0		
	Married	5	41.7	15	57.7	0	0	1.06	
	Unmarried	1	8.3	0	0	1	50.0		

Marital status	Divorce	3	25.0	2	7.7	0	0	2	0.588
	widow	3	25.0	9	34.6	1	50.0		
Educational status	No formal education	1	8.3	6	23.1	1	50.0	7.379	<0.0001*
	Primary school	2	16.7	13	50.0	1	50.0		
	High School	7	58.3	5	19.2	0	0		
	Graduate	2	16.7	2	7.7	0	0		
	Post Graduate	0	0	0	0	0	0		
Source of income	Pension	2	16.7	2	7.7	0	0	8.907	<0.0001*
	Children	0	0	0	0	0	0		
	Other Source	5	41.7	1	3.8	0	0		
	Nil	5	41.7	23	88.5	2	100.0		
Previous occupation	Employed	6	50.0	6	23.1	1	50.0	2.932	0.375
	Unemployed	6	50.0	20	76.9	1	50.0		
Religion	Hindu	2	16.7	15	57.7	1	50.0	5.892	<0.0001*
	Muslim	4	33.3	7	26.9	1	50.0		
	Christian	5	41.7	1	3.8	0	0		
	Others	1	8.3	3	11.5	0	0		
Preferred Diet	Veg	0	0	10	38.5	1	50.0	6.461	0.005*
	Non Veg	12	100.0	16	61.5	1	50.0		

***statistically significant** **N=40**

Table 3: suggests that 75% of the 60 to 70 year population perceived mild pain, 26.9% had moderate pain and among 71 to 80 year age group range, 25% had mild pain, 73.1% had moderate pain .Only 100% people reporting of severe pain under age group of 71-80 years. There was a statistically significant association between the variables ($p<0.0001$).

In the present study, association was sought between the mean pre-test pain score and there selected sociodemographic variables in which A statistically significant association was noted between the age category and pre test scores($p=0.011$).Statistically significant association was noted in educational status ($p<0.0001$), source of income ($p<0.0001$), religion ($p<0.0001$) and preferred diet($p=0.05$) was also significantly associated with the pretest pain score. Other sociodemographic variables such as Gender ($p=1.000$),Marital status ($p=0.588$), nature of previous occupation($p=0.375$) shown non-significant association with pre-test pain score.

4. DISCUSSION

The discussion of the study revealed which is based on the findings obtained from the statistical analysis and its relation to the objective of the study. The basic aim of present study was to evaluate the effectiveness of kneading technique on joint pain among old age people with osteoarthritis. Purposive sampling technique was used to select the subject for conducting the study from MP old age home, Shri Krishna Ananda ashram old age home. The sample size was 40 old age people with osteoarthritis. Visual analogue scale tool was used to assess the level of pain . The response was analyzed by using descriptive statistics (mean, SD, frequency and percentage) and inferential statistics (paired “t” and chi square test).

The findings of the study was supported by A study conducted to assess the level of joint pain among arthritis patients. The objective of the study to assess the level of joint pain of 60 adult subjects using convenience sampling technique. Self-administration of the extremities functional scale was used to measure the level of joint pain. The result shows that 48.2% of subjects had severe joint pain, 30.5% had moderate joint pain, and 21.3% had mild joint pain. Hence it is concluded that most of the patients had severe joint pain.

5. CONCLUSION

From the results of the study, it is concluded that providing kneading technique to the old age people with Osteoarthritis was effective in reducing the joint pain. This alternative therapy was not only cost effective but also easy to follow. The old age people with osteoarthritis can easily include this therapy in their own daily routine activities.

6. DECLARATION

Competing interests: The authors declare that they have no competing interests.

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