



EFFECTIVENESS OF QUADRICEPS STRENGTHENING EXERCISES ON KNEE JOINT PAIN AMONG WOMEN IN SELECTED VILLAGES OF D&NH

Nursing

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ABSTRACT

Knee joint is a common problem which originates in bony structures including the knee joint (femur, tibia and fibula), the kneecap (patella), or the ligaments and cartilage of the knee. 1 The incidence increases with age. It is a major cause of disability. It is more prevalent in above 50 years age group. 2 The aim of the study was to assess the effectiveness of quadriceps strengthening exercises on knee joint pain, with the view to improve the quality of life of women suffering from knee joint pain. Quasi-experimental time series research design was used for 60 women with knee joint pain. Overall result showed that reduction in the number of samples with moderate pain, the intensity of knee joint pain decreased from O1 to O3 in the experimental group. The study concluded that quadriceps strengthening exercises were effective in reducing level of knee joint pain among the women.

KEYWORDS

Effectiveness; Quadriceps strengthening exercise; Knee joint pain

1. INTRODUCTION

Knee joint pain is a chronic disease which includes progressive destruction of articular cartilage and decrease of synovial fluid that lubricates those joints. It progresses slowly with usual signs and symptoms being pain and limitation of the range of motion.³ It affects 22-39% population in India. It causes disability in 60-70% of the population above 60 years.⁴ The severity of the pain increases with age and a greater percentage has pain associated with disability.⁵ A study was conducted to assess the effect of quadriceps muscle strengthening exercise on quadriceps and hamstring strength ratio in knee osteoarthritis among 16 female patients with knee osteoarthritis. Quadriceps muscle strengthening exercise was given to the subjects 3 times a week during 8 weeks. Overall results revealed that the quadriceps muscles improved the joint pain significantly. The average right quadriceps muscle strength before exercise was 12.46 and after exercise were 18. The average left quadriceps muscle strength before and after exercise were 11.59 and 17.7, respectively. The study concluded that there are quadriceps muscle strength improvements after practicing quadriceps muscle strengthening exercise.⁶ A cross sectional study was conducted to assess the effectiveness of home exercise on pain and disability from osteoarthritis of the knee among 191 men and women with knee pain aged 40-80 years. Pain score was reduced by 22.5% in the experimental group and by 6.2% in the control group (between group difference $p < 0.05$, unpaired t test). Physical function scores was reduced by 17.4% in the exercise group and were unchanged in controls ($p < 0.05$).⁷ This research aimed to assess the effectiveness of quadriceps strengthening exercises on knee joint pain among women in selected villages of Dadra and Nagar Haveli.

OBJECTIVES OF THE STUDY

- Find the effectiveness of quadriceps strengthening exercises in terms of difference in the mean pretest and post-test knee joint pain scores between the experimental and control group.
- Find the association between pretest scores of knee joint pain and selected demographic variables.

HYPOTHESES

- H₁:** There will be significant difference in the mean of knee joint pain scores in the experimental and control group.
- H₂:** There will be significant association between intensity of knee joint pain with selected demographic variables.

METHODOLOGY

RESEARCH APPROACH:

An evaluative approach was adopted to assess the effectiveness of quadriceps strengthening exercise on knee joint pain among women.

RESEARCH DESIGN:

A quasi-experimental time series design with one group experimental and one group control group was adopted for this study to evaluate the effectiveness of quadriceps strengthening exercise on knee joint pain

among women.

Symbolic Presentation of Research Design:

After				
O ₁	X ₁	O ₂	X ₂	O ₃
		15 days		15 days

Key:

O₁: pretesting administration of demographical Performa, clinical Performa and modifiable pain score to selected women with knee joint pain.

X₁-X₂: 15 days administration of quadriceps strengthening exercise on women.

O₂-O₃: Administration of posttest modifiable pain score to assess effectiveness of quadriceps strengthening exercise on knee joint pain of the selected women.

RESEARCH SETTINGS:

The study was conducted in Dadra and Nagar Haveli. The experimental group was selected from Galonda village and control group from Athola village.

POPULATION:

The population for the study consisted of women experiencing knee joint pain in the age group of 40-65 years residing in Galonda and Athola villages of Dadra and Nagar Haveli.

SAMPLE:

The sample comprised of 60 women, 30 in experimental and control group experiencing knee joint pain at least for the past two months in the age group of 40-65 years residing in Galonda and Athola villages respectively.

SAMPLE SIZE:

In the present study the sample size were 60 women who fulfilled the sample, sampling criteria were 30 each in the selected as the experimental and control group.

SAMPLING TECHNIQUE:

Non-probability purposive sampling technique was adopted to assess the effectiveness of quadriceps strengthening exercise on knee joint pain among women.

DESCRIPTION OF TOOL:

- TOOL 1 - Demographic Performa:** It consists of demographic variables.
- TOOL 2 - Modifiable Pain Score:** The pain score is a non-standardized tool for the assessment of pain and the interference

with daily activities. The pain score uses simple numeric rating scales from 0 to 10 that are easy to understand. On the pain is categorized as mild for a pain score of 1–4, moderate for a pain score of 5–6, and severe for a pain score of 7–10.

RESULT

This section deals with the description of demographical Performa of the women with knee joint pain and is explained in frequency and percentage distribution.

Table 1: Frequency and Distribution of samples based on Demographic Characteristics.

n = 60

Sample Characteristics	Experimental group		Control group	
	(f)	(%)	(f)	(%)
Age (in years)				
40-45	6	20	12	40
46-50	8	26.67	6	20
51-55	5	16.67	6	20
56-60	8	26.67	6	20
61-65	3	10	0	0
Educational status				
Illiterate	18	60	13	43.4
Primary(1-4 th)	9	30	10	33.3
Middle school Certificate	3	10	5	16.6
High school Certificate	0	0	2	6.7
Pre-university course Certificate	0	0	0	0
Diploma/graduate	0	0	0	0
Post graduate	0	0	0	0
Occupation				
Professional	0	0	1	3.34
Skilled worker	0	0	1	3.34
Semi-Skilled worker	0	0	3	10
Unskilled worker	1	3.33	2	6.6
House wife	29	96.67	23	76.7
Do you have any family history of knee joint pain?				
Yes	4	13.33	2	6.7
No	26	86.67	28	93.3

Do you attain menopause?				
Yes	23	76.67	17	56.7
No	7	23.33	13	43.3
Do you take milk in your daily diet?				
Yes	3	10	6	20
No	27	90	24	80
If yes, how much milk do you take in your daily diet?				
< 151 ml	1	3.33	2	6.66
151-200 ml	1	3.33	2	6.67
201-300 ml	1	3.34	2	6.67
> 300 ml	0	0	0	0
Types of diet.				
Vegetarian	19	63.34	14	46.7
Non-vegetarian	11	36.6	16	53.3

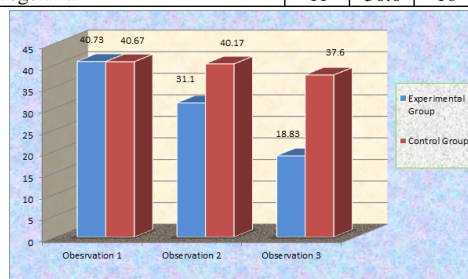


Figure 1. Mean score of Pain level in Experimental Group and Control Group.

Table 2: Effectiveness of Quadriceps Strengthening Exercises on Joint Pain Among Women.

N = 60

Study group	Pain	F-value	df	p-value
Control group	Within group	2.160	(1,29)	0.151
	Between group			
Experimental group	Within group	108.553	(1,29)	P<0.001***
	Between group			

P<0.001***= highly significant.

Table 3: Association between pretest level of pain and selected demographic characteristics.

N = 60

DEMOGRAPHIC VARIABLES	CONTROL GROUP					EXPERIMENTAL GROUP				
	MILD		MODERATE		X2 (df)	MILD		MODERATE		X2 (df)
	F	%	F	%		F	%	F	%	
Age(in years):										
40-45	11	36.7	1	3.3	20.8 (df=3) S	4	13.3	2	6.7	3.41 (df=4) NS
46-50	2	6.7	4	13.3		2	6.7	6	20	
51-55	0	0	6	20		1	3.3	4	13.3	
56-60	0	0	6	20		3	10	5	16.7	
61-65	0	0	0	0		1	3.3	2	6.7	
Educational status :										
Illiterate	0	0	13	43.3	20.22 (df=3) S	3	10	15	50	7.75 (df=2) S
Primary	6	20	4	13.3		6	20	3	10	
Middle School	5	16.7	0	0		2	6.7	1	3.3	
High school	2	6.7	0	0		0	0	0	0	
Pre-university	0	0	0	0		0	0	0	0	
Diploma/graduate	0	0	0	0		0	0	0	0	
Post graduate	0	0	0	0		0	0	0	0	
Family History :										
Yes	2	6.7	0	0	2.80 (df=1) NS	2	6.7	2	6.7	0.35 (df=1) NS
No	11	36.7	17	56.7		9	30	17	56.7	
Attain menopause:										
Yes	1	3.3	16	53.3	22.8 (df=1) S	7	30.4	16	69.5	0 (df=1) NS
No	12	40	1	3.3		4	13.3	3	10	
If yes, how many years back:										
<3	1	5.9	2	11.8	4.95 (df=3) NS	2	8.7	7	30.4	4.91 (df=3) NS
3-5	0	0	5	29.4		1	4.3	6	26.1	
6-10	0	0	7	41.2		3	13.3	1	4.35	
11-15	0	0	2	11.8		1	4.3	2	8.7	
16-20	0	0	0	0		0	0	0	0	
>20	0	0	0	0		0	0	0	0	
Milk diet daily:										
Yes	4	13.3	2	6.7	1.66 (df=1) NS	1	3.3	2	6.7	0.01 (df=1) NS
No	9	30	15	50		10	33.3	17	56.7	

Consumption of milk daily:										
<151 ml	1	25	1	25	1.33 (df=1)	1	50	0	0	0
151-200 ml	2	50	0	0	0	0	0	1	50	(df=1)
201-300 ml	0	0	0	0	NS	0	0	0	0	NS
>300 ml	0	0	0	0	0	0	0	0	0	0
Type of diet:					8.29 (df=1)					0.74 (df=1)
Vegetarian	12	40	7	23.3	4	13.3	10	33.3	30	NS
Non-vegetarian	1	3.3	10	33.3	7	23.3	9	30	30	NS

*-P<0.05, significant and **-P<0.01 & ***-P<0.001, Highly significant

CONCLUSION

The study can be concluded that quadriceps strengthening exercises can be used to improve knee joint pain among women. The nurse must teach and demonstrate exercises to people with complaints of knee joint pain in the community as well as health centre.

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