IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 5, Issue 4 Ver. IV (Jul. - Aug. 2016), PP 75-78
www.iosrjournals.org

A Quasi Experimental Study to Assess The Effectiveness of Quadriceps Strengthening Exercises on Knee Joints Pain Among Women in Selected Rural Areas of Ludhiana, Punjab.

Mrs. Kamaljeet kaur[1], Mr. Gaurav Kohli[2]
[1,2]*(Community Health Nursing/G.H.G College of Nursing, Raikot (Pb.) /Baba Farid University Health and Science, Punjab, India)*

Abstract: *The present study was conducted to assess the effectiveness of quadriceps strengthening exercises on knee joints pain among women in selected rural areas of Ludhiana, Punjab. Objectives of the study were to assess the pretest and posttest knee joints pain among women in control & experimental group, to compare pretest and posttest knee joints pain among women in control group, to compare pretest and posttest knee joints pain among women in experimental group, to find out the relationship of pretest and posttest knee joints pain among women in Control and Experimental with selected demographic variables. The conceptual framework of the study was based on general systems theory by Ludwing Von Bertalanffy (1968). Purposive sampling technique was used and 100 women (50 experimental and 50 control) were included in the study. In control group pretest, maximum 38(76%) pain score was severe similarly in posttest Maximum 33(66%) women had severe pain. In experimental group pretest, maximum 37(74%) of women had severe knee joint pain whereas posttest maximum 50(100%) of women had moderate level of knee joints pain score. The difference (28.503) between pretest and posttest score of experimental group was found highly significant at p≤0.001 level.*

Keywords: *knee joints, pain, quadriceps, exercise, effectiveness*

I. Introduction

As age increases the capabilities of organ system also changes at the every stage of life span. Ageing is a natural process, and should be regarded as a normal, inevitable biological phenomenon. Keeping oneself healthy and active with ageing is one of the most important aspects of life. With the passage of time certain changes take place in an organism. These changes are deterious for the most part of body and eventually lead to the death of the organism. **[1].** Knee joint pain is a very common condition and frequent problem presenting to general population. The overall prevalence of knee joint pain in the population is approximately 19% menopausal women. The incidence increases steadily with age. Furthermore the severity of the pain increases with age and a greater percentage has pain associated with disability. Hormones play a major role in a woman's bone and joint health. Women are more vulnerable than men to have conditions that cause joint pain owing to the hormonal fluctuations **[2].**

McMaster Universities Osteoarthritis Index (WOMAC) and Short Form 12 (SF 12). The physical function was assessed using the tests consisting of standing balance, usual walk and chair stands. The study found out that, the overall prevalence of knee pain was 46.2% (32.2% in men and 58% in women). The prevalence increased with age in women until 70 years and then leveled off. There was significant association between knee pain and gender, body mass index, educational level, smoking, occupation, living without spouse, income and the presence of radiographic knee Osteoarthritis **[3].** To reduce the knee joint pain there is manipulation or adjustment. Correct biomechanics must be achieved through a rehabilitation program which focuses on restoring flexibility to tight muscles (commonly calves, hamstrings and quadriceps) **[4].**

According to a comparative study of hamstring and quadriceps strengthening treatments in the management of knee osteoarthritis .40 patients with knee joint pain aged 50-65 years was divided into 2 groups. The first group (57.65±4.78 years) received hot packs and performed strengthening exercises for the quadriceps and hamstring and stretching exercise for the hamstring. The second group (58.15±5.11 years) received hot packs and performed stretching exercise for only the quadriceps and stretching exercise for the hamstring. Outcome measures were the WOMAC (Western Ontario and McMaster Universities OA index questionnaire) Visual Analogue Scale (VAS) assessment of pain the Fifty-Foot Walk Test (FWS) and Handheld dynamometry. The findings of this study revealed that there was a significant difference between the groups. The first group showed a more significant result than the second group. Strengthening of the hamstrings in addition to strengthening of the quadriceps was shown to be beneficial for improving subjective knee pain, range of motion and decreasing the limitation of functional performance of patients with knee osteoarthritis **[5].**

According to study to assess the effectiveness of Aerobic walking or strengthening exercise for osteoarthritis of the knee. To compare the efficacy of aerobic walking and home based quadriceps strengthening

exercises in patients with knee osteoarthritis. 35 randomised control trials were identified, 13 of which met inclusion criteria and provided data suitable for further analysis. Pooled effect sizes for pain were 0.52 for aerobic walking and 0.39 for quadriceps strengthening. For self reported disability, pooled effect sizes were 0.46 for aerobic walking and 0.32 for quadriceps strengthening. The result of study revealed that both aerobic walking and home based quadriceps strengthening exercise reduce pain and disability from knee osteoarthritis but no difference between them was found on indirect comparison [6].

The purpose of this study was to assess the effectiveness of quadriceps strengthening exercises practices for 30 days on knee joints pain in experimental group and to create awareness among control group by arranging one day demo class of quadriceps strengthening exercises after the posttest.

Women are not aware about the use of quadriceps strengthening exercise on knee joints pain. Therefore the investigator got interest to assess the effectiveness of quadriceps strengthening exercises on knee joints pain among women in order to improve their knowledge and reduce knee joint pain which will help in self care of women. Moreover this area found less covered and revealed. This was an appropriate area to inculcate & improve women knowledge regarding quadriceps strengthening exercises as it would help them to alleviate pain and strengthen the knee joints. This kind of studies are not much in number yet, so this study would be add on to studies on quadriceps strengthening exercises. This will help in early management and also increases their life expectancy and improve their quality of life. So they can take care of themselves. This fact motivated the investigator to select this as the problem statement.

II. Methodology

2.1 Research approach & Design: was quantitative research approach and quazi experimental, a type of /Experimental design were utilized.

2.2 Independent variable: was demonstration and practices of quadriceps strengthening exercises

2.3 Dependent variable: was knee joints Pain among Women

2.4 Demographic variables such as Age in years, Educational status, Occupation, Type of family, Family income (Rs per month), Duration of disability, Mass media exposure.

2.5 Research setting: Were villages, Akalgarh and Gondwal. The geographical boundary of Akalgarh is 8 km at west side. Village Gondwal was taken as control group for study and total population were 2382 there were 1139 females. Akalgarh was taken as an experimental group for study and total population were 1680, there were 700 females.

2.6 Sample Size and sampling technique: The total sample size was 100. The Purposive Sampling technique was used. 50 women were taken in control group from Gondwal and 50 were in experimental group from Akalgarh.

2.7 Selection and development of tool:

The final tool (structured rating interview questionnaire) consists of the following two parts.

- **Part I: Sample characteristics**

This part consists of seven items for obtaining personal information i.e. Age in years, Educational status, Occupation, Type of family, Family income (Rs per month), Duration of disability, Mass media exposure.

- **Part II: Tool for assessment of knee joint pain**

It consists of tool for assessment of knee joint pain. These items consist of 31 rating interview questions and matrix checklist. Each question has four options which have been allotted a number; the number allotted to an option is score for the same.

- **Part III:** An interventional quadriceps strengthening exercises module

Self structured quadriceps strengthening exercise manual consists of; type, duration and method of exercises.

2.8 Validity of tool

Content validity of the tool was confirmed by expert's opinion regarding the relevance of items. The tool was given to 17 experts from the field of nursing, medical surgical nursing, child health nursing, community health nursing, psychiatry nursing and obstetrics and gynecological nursing as well as tool was given for validation to physiotherapist and orthopaedician. In total there were 34 items 3 items were deleted and 2 were modified according to the experts suggestions. The final tool consisted of 31 rating questions after making necessary changes.

2.9 Reliability of the tool

Reliability of the tool was calculated by test retest method and calculated by Karl Pearson's co-efficient of correlation. Reliability of tool was found to be 0.98 and hence the tool was reliable.

2.10 Pilot study

Pilot study is a miniature of major study. The pilot study was conducted in the month of February 2016 to ensure the reliability of tool and feasibility of the study

2.11 Data Collection

Data collection was conducted during the month of March 2016 after discussing the purpose and objectives of the study with the experts of the institution to collect data. The pre test was administered to women of control and experimental group. An interventional quadriceps strengthening exercises module was administered to experimental group for 30 consequent days. The control group was not exposed to structured teaching. The time spent in the teaching was 1 hour. Post- test was taken after 30 days of pre test from both control and experimental group.

2.12 Ethical considerations

Approval was taken from research and ethical committee of GHG College of Nursing. A Written Permission was taken from principal of GHG College of Nursing. Administrative permission was taken from the Sarpanch of concerned areas. The purpose of study was explained to the women and written consent was taken from them for their participation in study. They were also told about their right to refuse from participating in the study. The women were assured about their health safety.

2.12 Difficulties faced by Investigator

1. The investigator found great difficulty in seeking attention of each and every woman personally.
2. It was quite difficult for investigator to assemble all the women at one place at one time.
3. Many times investigator had to wait for women as they were occupied with their household work.

III. Results

In control group pretest, maximum 38(76%) women pretest knee joints pain score was severe, whereas minimum 12(24%) women had moderate knee joints pain score. In control group posttest Maximum 33(66%) women had severe pain whereas minimum 17(34%) had moderate pain knee joints pain score. In experimental group pretest maximum 37(74%) of women had severe knee joint pain whereas 13(26%) of women had moderate knee joint pain score. In experimental group posttest maximum 50(100%) of women had moderate knee joints pain score. The pretest and posttest pain scores of control group were 65.04, 64.70 respectively. The difference (0.526) between pretest and posttest pain score of control group was found no significant at $p \leq 0.05$ level. In experimental group pretest and posttest mean pain scores were 66.14, 41.00 respectively. The difference (28.503) between pretest and posttest score of experimental group was found highly significant at $p \leq 0.001$ level. The difference (29.830) between posttest pain score of control and experimental group found highly significant at $P \leq 0.01$ level.

Figures and Tables

N=100

		Pain Score					
Groups		**Pretest**		**Posttest**			
	n	**Mean**	**SD**	**Mean**	**SD**	**df**	**t**
Control Group	50	65.04	3.14	64.70	4.748	98	0.526^{NS}
Experimental Group	50	66.14	4.99	41.00	3.003	98	28.503***
	df	**t**		**df**	**t**		
	98	1.321^{NS}		98	29.830***		

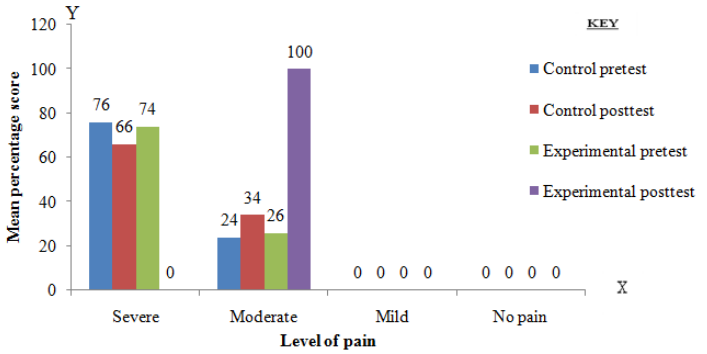

Fig 3: Percentage distribution of pre- test and post-test knee joints among women in rural areas in experimental and control group

IV. Conclusions

In the present study women were distributed into control and experimental group according to age in years, educational status, occupation, type of family, family income(Rs/per month), duration of disability and mass media exposure. The calculated difference (28.503) of ANOVA between pretest and posttest score of experimental group was found highly significant at $p \leq 0.001$ level. Hence it is inferred that the alternate hypothesis (H_1) the posttest pain level of women in experimental group will be significantly lower than the control group at $p \leq 0.05$ level as measured by structured interview questionnaire at $p \leq 0.05$ levels was accepted and null hypothesis (H_0) is rejected. According to age in years, educational status, occupation, type of family, family income (Rs/per month), duration of disability and mass media exposure the calculated values of ANOVA between and within the group found non-significant at $P \leq 0.05$. Hence it was concluded that there was not any relationship of these variables and knee joints pain. According to the age calculated ANOVA values between and within group found significant at $p \leq 0.05$.Hence it was inferred that there was significant relationship between knee joints pain among women with Educational Status in control group.

Acknowledgement

I am highly grateful to Mrs. Shamim Sagar master of nursing, Principal, professor & Head department of Child Health Nursing, Guru Hargobind College of Nursing, Raikot, Ludhiana, Punjab, for her timely suggestions throughout the study. I express my gratitude and appreciation to my Guide Mr. Gaurav Kohli (Community Health Nursing) Assistant professor Guru Hargobind College of Nursing for his constant encouragement, valuable guidance, supervision and timely help during entire course of study. I would like to pay high regards to my parents S.Gurdial Singh & Mrs. Jaswinder Kaur brother and sisters Jagdeep Singh,Sukhpreet Kaur&Harpreet Kaur my in laws and my loving husband Mr. Harvarinder Singh Gill my family and my friends Prabhjeet Kaur for their sincere encouragement and inspiration throughout my research work and lifting me uphill this phase of life.

References

[1]. Am J. The effects of quadriceps strengthening on pain function and patelo femoral joint: contact area in persons with patellofemoral pain. Journal of women's health .2012; 91(2):88-90.
[2]. World Health Organization[WHO]/Osteoarthritis/Cennsus;2011.<http:// www.ORG.
[3]. Kim JI. Prevalence of Knee Pain and Its Influence on Quality of Life and Physical Function in the Korean Elderly Population. A Community Based Cross-Sectional Study: J Korean Med Scie.2011 Sep; 10(5):122-30.
[4]. Yip SL, Ng GY.Biofeedback Supplementation to Physiotherapy exercise Programme for rehabilitation of Patellofemoral Pain Syndrome: A randomized Controlled Pilot study. Clin Rehabil.2006; 20(10):50-57.
[5]. Johani AH, Kachanath J, Hafez A, Ahaideb A,Algarni AD,Meshari A .Concentric Versus Enhanced Eccentric Hamstring Strength Training: Clinical Implications. Athl Train 2010; 33(3):216-21.
[6]. Roddy E, Zhang W, Doherty M. Aerobic walking or strengthening exercise for osteoarthritis of the knee? A systematic review. Ann Rheum Dis 2006;64 (4):544-48. Available From http://ard.bmj.com/content/64/4/544.short