

# Knee Joint Pain and Daily Living Activities among Elderly People with Different Knee Osteoarthritis in Selected Rural Area in Chennai

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## ABSTRACT

**Background:** Knee osteoarthritis (KOA) is a chronic, degenerative knee joint disorder associated with inflammation, pain, stiffness, and reduced functional abilities, thereby impacting the patient's quality of daily living activities in their life. The prevalence of Knee osteoarthritis is growing rapidly in India and around the globe, even in younger populations. OA pain, swelling and stiffness can make it difficult for individuals to perform simple activities of daily living (ADL). In old age, physical functions such as leg strength, balance and mobility of the leg joints decreases markedly with age. Prevention of a reduction in these physical functions is important to allow the elderly to continue a healthy and independent daily life. The ADL survey was used to assess the physical ability which are necessary for the elderly to live independent daily life. Our study examines the ability to achieve various ADLs among the elderly people those with mild, moderate and severe knee joint pain.

**Objectives:** To determine the prevalence of Knee joint pain and its impact over Daily Living Activities among Elderly People with different Knee Osteoarthritis.

**Methods:** A community based cross sectional study was conducted on 50 elderly People above the age of 60 Years during the period of January to March 2020 in rural area at Mangadu Chennai. The questionnaire covered data regarding population socio-demographics such as gender, age, education level, and occupation.

**Results:** The percentage level of numerical pain score among elderly people living in rural area. In general, 8.00% of the male having no pain level of score, 34.00% of them are having mild level of pain score, 50.00% of them having moderate level of pain score and 8.00% of them having severe level of pain score. The percentage level of activities of daily living score among elderly people living in rural area. In general, 10.00% of the male having very dependent level of score, 48.00% of them are having dependent level of score, 42.00% of them having independent level of score.

**Conclusion:** There is a significant negative moderate correlation between Pain score and activities of daily living score. It means pain score decreases their activities of daily living score increases moderately.

**Key words:** Knee osteoarthritis, Knee joint pain, Daily living activities, Numerical pain rating scale

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## INTRODUCTION

Osteoarthritis (OA) is a chronic, degenerative disorder of unknown cause characterized by gradual loss of articular cartilage, hypertrophy of bone at the margins, subchondral sclerosis, and range of biochemical and morphological alterations of the synovial membrane and joint capsule [1]. It is one of the most common joint disorders worldwide [2]. It ranks fourth in health impact in women and eighth in men in the western world, whereas it is the second most common rheumatologic problem and the most frequent joint disease with a prevalence of 22% to 39% in India [3]. OA is more common in women than men, but the prevalence increases dramatically with age [4]. OA can contribute to inactivity with ageing, secondary to pain and

reduced function, thus ultimately impairing quality of life. OA pain, swelling and stiffness can make it difficult for individuals to perform simple activities of daily living (ADL) such as opening boxes of food, tucking in bed sheets, writing, using a computer mouse, driving a car, walking, climbing stairs and lifting object [5]. In old age, physical functions such as leg strength, balance and mobility of the leg joints decrease markedly with age. Prevention of a reduction in these physical functions is important to allow the elderly to continue a healthy and independent daily life [6]. The ADL survey was used to assess the physical ability which are necessary for the elderly to live independent daily life. Sugiura et al. reported that the elderly subjects with knee pain had difficulty in achieving locomotion when comparing to those without knee pain [7]. However, each ADL has respective different difficulty level [8]. The difficulty level exists from low activities to high activities. The elderly with severe knee pain will have difficulty to perform various ADLs than people with mild knee pain [6].

Among different leg joints, knee joints have the greatest load-bearing capacity, and body weight is imposed on each knee joint when standing and walking. Knee joints are important for achieving independence in ADLs [6]. Recent studies have shown that there is an increased prevalence of severe knee joint pain in elderly people. O’Reilly et al and McAlindon et al have reported that approximately 25% of the elderly have mild or severe knee pain [9,10]. Peat et al reported that the prevalence of mild and severe knee pain is high in the elderly female [11]. Hence it is necessary to examine the association of knee osteoarthritis with activities of daily living (ADL) in elderly people. Our study aims to examine the ability to achieve various ADLs among the elderly people those with mild, moderate and severe knee joint pain.

**MATERIAL AND METHODS**

A community based cross sectional study was conducted on 50 elderly people above the age of 60 years during the period of January to March 2020 in rural area at Mangadu, Chennai. Information was collected by using a pre-tested, semi-structured questionnaire after obtaining informed oral consent. The questionnaire covered data regarding population socio-demographics such as gender, age, education level, and occupation. Relevant data was collected thereby examining the differences in the ability to achieve various activities of daily living (ADLs) among the elderly people those without knee joint pain, those with mild knee joint pain, and those with severe knee joint pain.

**Statistical analysis**

Demographic variables in categorical/dichotomous were given in frequencies with their percentages. Pain score and activity score were given in mean and standard deviation. Correlation between pain score and activity score were analyzed using Karl Pearson correlation coefficient method.

Association between level of pain score and activity score with demographic variables were analyzed using chi square test/Yates corrected chi square test. Influencing factors for pain score and activity score are identified using univariate and multivariate analysis.

Simple bar diagram, simple bar with 2 standard deviation bar diagram, and Scatter diagram with regression estimate were used to represent the data. A p-value of  $\leq 0.05$  was considered statistically significant, and two-tailed tests were used for testing significance. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS, version 22).

**RESULTS**

Table 1 shows the demographic information of elderly people those who are participated for the following study on “Knee Joint Pain and Daily Living Activities among Elderly People with different Knee Osteoarthritis in selected Rural Area in Chennai.”

**Table 1: Demographic variables.**

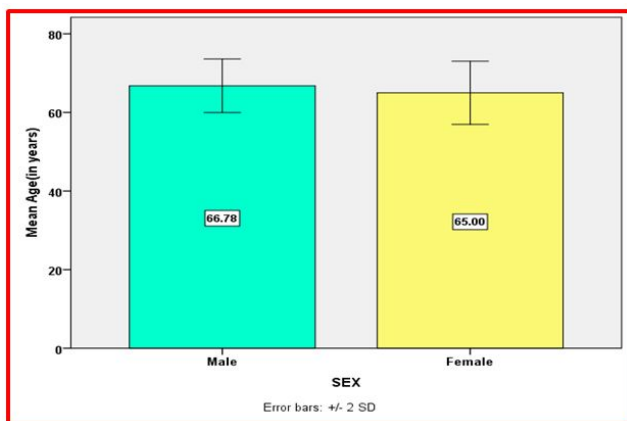
Demographic variables		Number of elderly people	%
Age group	60-65 yrs.	24	48.00%
	66-70 yrs.	21	42.00%
	71-75 yrs.	5	10.00%
Sex	Female	32	64.00%
	Male	18	36.00%
Education	College	3	6.00%
	High school	20	40.00%
	Higher secondary school	17	34.00%
	Primary school	10	20.00%
Marital status	Divorced	2	4.00%
	Married	32	64.00%
	Separated	3	6.00%
	Unmarried	4	8.00%
	Widow	9	18.00%
Type of family	Joint family	28	56.00%
	Nuclear	22	44.00%
Nature of work	Heavy work	19	38.00%
	Moderate	13	26.00%
	Sedentary work	18	36.00%

Family income	<5,000	10	20.00%
	>10,000	20	40.00%
	5,000- 10,000	20	40.00%
Hobbies	House hold work	10	20.00%
	Reading books	13	26.00%
	Watching TV	30	60.00%
Duration of knee joint pain	< 5 YRS	10	20.00%
	> 5 YRS	25	50.00%
	0-1 YR	15	30.00%
Knowledge about yoga	No	24	48.00%
	Yes	26	52.00%

Males mean age is 66.7 years and females mean age is 65 years. Overall elders mean age is 65.64 years and SD is 3.87 years (Table 2 and Figure 1).

**Table 2: Age wise sex distribution.**

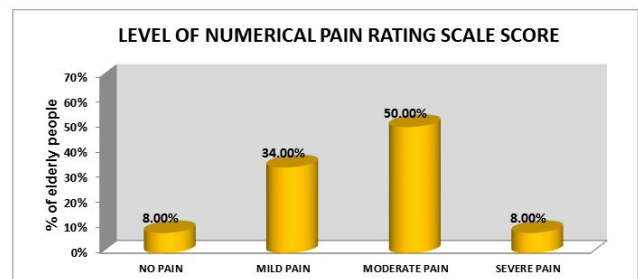
Sex	N	Mean age years	Std. Deviation	Student independent t-test
Male	18	66.78	3.41	t=1.58 p=0.12(NS)
Female	32	65	4.02	



**Figure 1: Simple bar diagram with 2 standard deviation shows the sex wise age distribution.**

Figure 2 and Table 3 shows the percentage level of numerical pain score among elderly people living in rural

area. In general, 8.00% of the male having no pain level of score, 34.00% of them are having mild level of pain score, 50.00% of them having moderate level of pain score and 8.00% of them having severe level of pain score.



**Figure 2: Simple bar diagram showing the level of numerical pain rating scale score.**

**Table 3: Level of numerical pain rating scale score.**

Level of score	No. of elderly people	%
No pain	4	8.00%
Mild pain	17	34.00%
Moderate pain	25	50.00%
Severe pain	4	8.00%
Total	50	100.00%

Figure 3 and Table 4 shows the percentage level of activities of daily living score among elderly people living in rural area.

In general, 10.00% of the male having very dependent level of score, 48.00% of them are having dependent level of score, 42.00% of them having independent level of score.

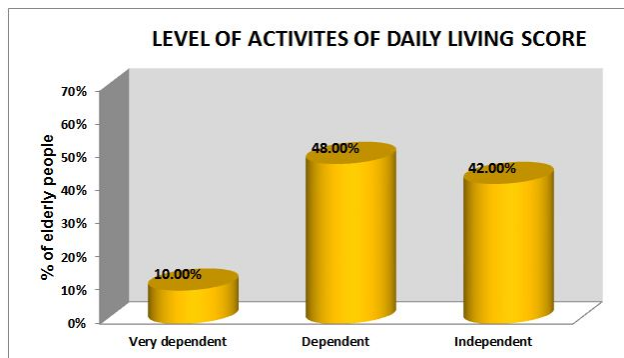


Figure 3: Level of activities of daily living score.

Table 4: Level of activities of daily living score.

Level of score	No. of elderly people	%
Very dependent	5	10.00%
Dependent	24	48.00%
Independent	21	42.00%
Total	50	100.00%

Table 5 shows the association between the level of daily activities score and demographic variable.

>65 years, males, nuclear family elders, watching TV elderly and > 5

yrs duration of knee joint pain elderly are having more dependent score than others. Statistical significance was assessed using chi square test/yates corrected chi square test.

Table 5: Association between level of activities of daily living scale score and elderly people demographic variables.

Demographic variables	ACTIVITIES OF DAILY LIVING SCALE SCORE				chi	Chi square test/ yates corrected chi square test.	Odds Ratio (95%CI)	
	Dependent		Independent					
	n	%	n	%				
Age group	> 65 yrs.	20	76.92%	6	23.08%	26	$\chi^2=13.48 \Pi=0.001^{***}(\Sigma)$	10.0(2.7 -36.6)
	≤ 65 yrs.	6	25.00%	18	75.00%	24		
Sex	Male	12	66.67%	6	33.33%	18	$\chi^2=3.42 \Pi=0.12(N\Sigma)$	2.5(0.8 -8.6)
	Female	14	43.75%	18	56.25%	32		
Education	Upto high school	18	60.00%	12	40.00%	30	$\chi^2=1.92 \Pi=0.17(N\Sigma)$	2.2(0.7 -7.1)
	Above High School	8	40.00%	12	60.00%	20		
Marital status	Married	13	40.63%	19	59.38%	32	$\chi^2=4.61 \Pi=0.03^{*}(\Sigma)$	3.8(1.1 -13.2)
	others	13	72.22%	5	27.78%	18		
Type of family	Joint Family	8	28.57%	20	71.43%	28	$\chi^2=13.99 \Pi=0.001^{***}(\Sigma)$	11.2(2.9 -43.9)
	Nuclear	18	81.82%	4	18.18%	22		
Nature of work	Heavy Work	12	63.16%	7	36.24%	19	$\chi^2=1.52 \Pi=0.27(N\Sigma)$	1.8(0.5 -5.9)
	Moderate to sedentary work	14	45.16%	17	54.84%	31		
Family income	<Rs.10,000	18	60.00%	12	40.00%	30	$\chi^2=1.92 \Pi=0.16(N\Sigma)$	1.8(0.5 -5.9)
	>Rs.10,000	8	40.00%	12	60.00%	20		
Hobbies	House hold work	2	18.18%	9	81.82%	11	$\chi^2=6.46 \Pi=0.01^{**}(\Sigma)$	1.8(0.5 -5.9)
	Watching TV	24	61.54%	15	38.46%	39		
Duration of knee joint pain	≤ 5 yrs	8	32.00%	17	68.00%	25	$\chi^2=6.48 \Pi=0.01^{**}(\Sigma)$	1.8(0.5 -5.9)

	>5 yrs.	17	68.00%	8	32.00%	25	
Knowledge about yoga	No	15	62.50%	9	37.50%	24	$\chi^2=2.04$ $PI=0.15(N\Sigma)$ $2.3(0.7-1.1)$
	Yes	11	42.31%	15	57.69%	26	

**DISCUSSION**

Osteoarthritis (OA) most often affects middle aged and elderly people. It can range from mild to moderate and severe, and most often occurs in the hands and weight bearing joints such as the knees, hips, feet, and back [4]. This cross-sectional study was aimed to examine the ability to achieve various activities of daily living (ADLs) among the elderly people those with mild, moderate and severe knee joint pain. In our study questionnaire was prepared regarding the population socio-demographic details such as gender, age, educational level, and occupation. Thereby collection of data was achieved and was used for statistical analysis.

Our findings suggests that 50.00% of the elderly people having moderate level of pain score, 34.00% of them showed mild level of pain score and 8.00% exhibited no pain level of score. Based on the activities of daily living (ADLs) of the elderly people about 10.00% of the people showed very dependent level of score whereas 48.00% of them exhibited dependent level of score and 42.00% showed independent level of score. Association between the pain score and the demographic variables showed about more than 65 yrs of aged elderly people (>65 years), heavy household working elderly people and elderly people with the duration of knee joint pain for more than 5yrs (>5 yrs.) exhibited more severe pain score than people with lesser than 65yrs of age (<65 years), sedentary household working and people with the duration of pain lesser than 3yrs (<3years) which are statistically significant (p<0.01). Correlation between the Pain score and the activities of daily living score were analyzed using Karl Pearson correlation test, which indicates that there is a significant negative moderate correlation between Pain score and activities of daily living score. Which means pain score decreases, their activities of daily living score increase moderately.

**CONCLUSION**

Our cross sectional questionnaire study has examined the ability to achieve various activities of daily living (ADLs) among the elderly people those with mild, moderate and severe knee joint pain and has concluded that there is a significant negative moderate correlation between Pain score and activities of daily living score. Which means pain score is inversely proportional to the activities of daily living score.

**FUNDING**

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**ETHICAL APPROVAL**

The study was approved by the Institutional Ethics Committee.

**CONFLICT OF INTEREST**

The authors declare no conflict of interest.

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