



Comparative Study to Assess Knee Joint Pain Among Elderly Men and Women in a Selected Rural Area in Chennai

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Abstract

Knee joint pain is a prevalent and debilitating condition among the elderly population, significantly impacting their quality of life and daily activities. Understanding the differences in knee joint pain between elderly men and women is crucial for effective management and tailored interventions. This comparative study aims to investigate and compare the prevalence, severity, and associated factors of knee joint pain among elderly men and women from rural areas in Chennai. The study will employ a cross-sectional design, recruiting a representative sample of elderly individuals aged around 50 years and above from various community settings. The participants will undergo a structured interview and clinical examination to assess knee joint pain, including its onset, duration, intensity, and functional limitations. Furthermore, demographic, anthropometric, lifestyle, and medical history data will be collected to identify potential risk factors associated with knee joint pain. Statistical analyses, including chi-square tests, t-tests, and logistic regression models, will be employed to determine the differences in knee joint pain prevalence and severity between elderly men and women. Additionally, the study will explore the associations between knee joint pain and various factors, such as age, body mass index, physical activity level, comorbidities, and hormonal status. The findings of this study are expected to provide valuable insights into the gender-specific patterns of knee joint pain among the elderly population. It is hypothesized that women may experience a higher prevalence and severity of knee joint pain compared to men due to hormonal factors, differences in biomechanics, and age-related musculoskeletal changes from rural areas of Chennai. Understanding these gender differences will enable healthcare professionals to develop targeted interventions and personalized treatment strategies to alleviate knee joint pain in elderly

individuals. Ultimately, this study aims to contribute to the existing literature on knee joint pain, promote evidence-based clinical practice, and enhance the overall well-being of elderly men and women by addressing their specific needs in managing knee joint pain.

Keywords: Knee joint, anthropometric, biomechanics, pain, women, body mass index

Introduction:

Pain is a distressing sensation that arises from intense or harmful stimuli, posing challenges in its precise definition due to its complex and subjective nature [1]. The International Association for the Study of Pain defines pain as an unpleasant sensory and emotional experience linked to actual or potential tissue damage, or described in terms of such harm. In the field of medical diagnosis, pain is considered a symptom indicative of an underlying condition [2].

Knee joint pain is a significant health concern among the elderly population, as it can lead to functional limitations, decreased quality of life, and increased healthcare utilization. Understanding the prevalence and impact of knee joint pain in different populations is essential for effective management and targeted interventions. Previous reports stated that post-menopausal women are particularly susceptible to a high incidence of knee joint pain due to the decrease in estrogen levels [3]. Estrogen provides a protective effect on joints, and its decline puts women at a higher risk of developing osteoarthritis and experiencing joint pains, even if they are undergoing hormone replacement therapy (HRT). These real-life consequences of knee joint pain necessitate significant attention in home care settings. Therefore, there is a growing need for effective home-based management strategies. Often, the utilization of home remedies is overlooked in the context of self-management of health issues [4]. However, home remedies have a rich tradition, especially among individuals with limited access to medical care or those facing discrimination within the healthcare system. Recognizing the importance of home-based management, healthcare providers should pay attention to empowering individuals to utilize home remedies for knee joint pain [5]. These remedies can complement medical treatments and alleviate symptoms, enhancing overall well-being and quality of life. Home-based management may include lifestyle modifications, such as exercise routines, weight management, and the application of heat or cold packs. Additionally, natural supplements, topical ointments, and traditional remedies can be explored for their potential benefits. Articular cartilage, as described by Frank R. Noyes in 1997, is a resilient and elastic protein material that covers the ends of bones. Its primary function is to provide cushioning and absorb shocks between the bones, preventing them from grinding against each other [6]. However, when the articular cartilage deteriorates, this protective cushion is lost, leading to various symptoms. The breakdown of articular cartilage results in the bones rubbing together, causing pain, swelling, the formation of

bone spurs, and a decrease in joint mobility. While osteoarthritis can affect any joint in the body, it commonly affects weight-bearing joints such as the knee [7]. Osteoarthritis of the knee, also known as OA Knee, is recognized as one of the top five causes of disability among elderly men and women [8].

In particular, exploring gender-based differences in knee joint pain can provide valuable insights into potential variations in risk factors, causes, and treatment strategies [9]. This study aims to assess and compare knee joint pain among elderly men and women to identify any gender-related disparities in prevalence, severity, contributing factors, and functional limitations.

Methodology

Study Design:

This study included a total of 100 individuals aged 55 to 75 years. The participants were divided into two groups based on gender status: men (n = 50) and women (n = 50). The sample of 100 individuals was selected from a rural area January and December 2021 (Thirneermalai, Kundrathur, Minjur, and Manali) in Chennai. The main study aimed to assess a sample of individuals aged 55 years and above, with specific subgroup divisions: Thirneermalai (n=25), Kundrathur (n=25), Minjur (n=25), and Manali (n=25). The purpose of the stratification was to ensure an adequate representation of respondents living in sheltered housing or receiving home care assistance in the age groups for women and men.

Sample Selection:

The sample for this study consisted of older individuals of women and men residing in various settings, including their own homes, nursing homes, daily wagers. Two reminders were sent to encourage participation. Out of the 500 questionnaires distributed, 381 were returned in a usable form, resulting in a mean age of 62.8 years (SD 5.7), with 61.6% of participants being women. A total of 82 questionnaires were deemed unusable due to missing data. The response rates varied across age groups, with 75-79 age group having a response rate of 60%, 70-74 age group with 56%, 65-69 age group with 48%, and 55 years and above age group with 42%. Additionally, 35 individuals (3% of the sample) were missed, either due to death (199 individuals) or unknown addresses (5 individuals), resulting in an overall response rate of 53%. Some participants provided reasons for not participating, with 6% citing lack of strength (1%), reporting simply not wanting to be part of the study (3%). Those who did not respond were significantly older (mean age 75.7, SD 6.1) and had a significantly higher proportion of females (69.6%) compared to those who participated ($P \leq 0.005$).

Data Collection:

When assessing knee pain in both women and men, the VAS can be utilized to obtain a direct measure of pain intensity, allowing for easy comparison between individuals. On the other hand,

the WOMAC questionnaire provides a more comprehensive assessment of knee pain, considering additional dimensions such as stiffness and physical function. By administering the WOMAC, we obtained a detailed understanding of the impact of knee pain on various aspects of daily life. Both the VAS and WOMAC are valuable tools for evaluating knee pain in research studies, clinical trials, and routine clinical practice. They enable the quantification and comparison of pain experiences between women and men, aiding in the assessment of treatment efficacy and the development of tailored interventions for knee osteoarthritis.

Data Analysis:

The collected data was analysed and the findings were presented separately for women and men. The analysis focused on comparing various factors including demographic data, social network, pain intensity, functional limitations, fatigue, sleeping problems, depressed mood, and quality of life among the different age groups. Statistical tests were applied to assess the differences between age groups both women and men among those experiencing pain. The chi-square test for trend was utilized when examining the trend of pain prevalence across age strata. The chi-square test was employed for comparisons involving nominal data, while the Mann-Whitney U test was used for ordinal and interval data when comparing between age groups. Within each age group, the Kruskal-Wallis one-way analysis of variance test was used to compare individuals with and without pain, and as a post-hoc test, the Mann-Whitney U test was applied.

Results:

The primary objectives of this comparative study are to determine the prevalence of knee joint pain among elderly men and women from rural areas in Chennai. And to assess the severity and impact of knee joint pain using standardized pain assessment tools for women and men, and also investigate gender-based differences in the risk factors, causes, and contributing factors associated with knee joint pain. Furthermore, to explore the effects of knee joint pain on functional mobility, quality of life, and activities of daily living in elderly men and women. Moreover, to provide insights for developing targeted interventions and strategies to manage and alleviate knee joint pain in elderly individuals for both genders. The results of the study will be presented in a comprehensive manner, including descriptive statistics, comparisons of pain scores between men and women, and associations between knee joint pain and other variables. In table 1, shows the description of demographic variables of study participants with knee joint pain among women and men group.

Table 1: Frequency and percentage distribution of demographic variables of elderly

Demographic Variables	Men		Women	
	No	%	No	%
Age in Years				
55-59	8	3.33	12	6.67
60-64	17	23.33	7	16.67
65-69	9	30.00	14	16.67
70-74	16	43.33	17	40.00
Past area of residence				
Most-rural	16	53.33	11	53.33
Rural	34	46.67	39	46.67
Nature of work				
Heavy	12	10.00	10	20.00
Moderate	21	20.00	11	16.67
Sedentary	17	70.00	29	63.33
Body Mass Index				
Under weight (<18.5)	19	3.33	14	6.67
Normal weight (18.5 – 25)	16	23.33	10	16.67
Over weight (25 - 30)	15	30.00	26	36.67

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Description of demographic variables of study participants with knee joint pain among women and men.

Demographic Variables	Men		Women	
	No	%	No	%
Obese (>30)	34	63.33	25	50.00
Dietary Pattern				
Vegetarian	19	30.00	24	50.00
Non-vegetarian	31	70.00	26	50.00
Exercise Habit				
Yes	10	10.00	8	10.00
No	40	90.00	42	90.00
Family History of Knee Joint Pain				
Yes	10	10.00	15	25.00
No	40	90.00	35	75.00
History of previous medical treatment for knee joint pain				
Yes	12	26.67	20	40.00
No	38	73.33	30	60.00

Assessment of pretest and post-test level of knee joint pain among study participants in men and women group

Table - 2: Frequency and percentage distribution of knee joint pain among the women and men in this study

Scoring pattern	Women		Men	
	Frequency	Percentage (%)	Frequency	Percentage (%)
No pain	3	10.08	2	16.7
Mild	23	41.7	9	18.3
Moderate	20	39.7	17	26.4
Severe	4	10.7	27	52.6
Total	50	100	50	100

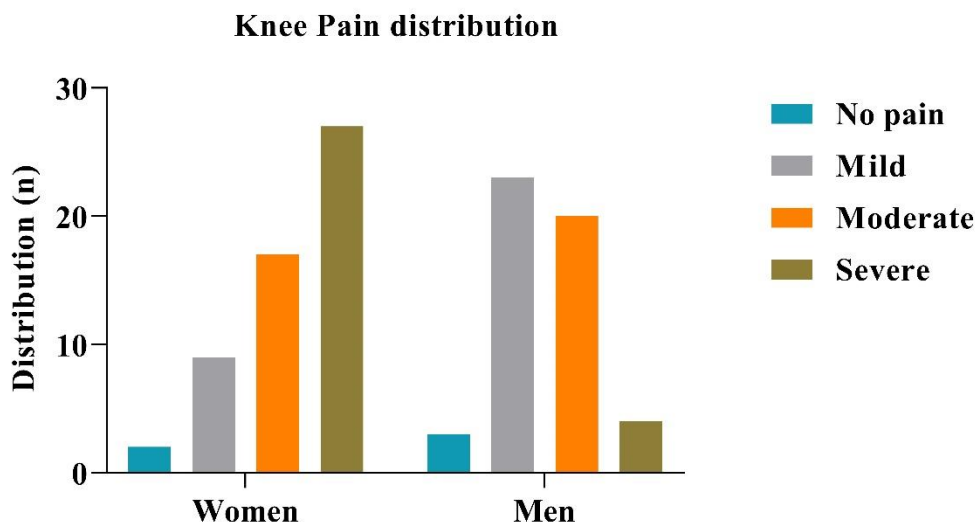


Fig 1: Knee pain distribution in various ranges (No pain, Mild, Moderate, and Severe) in women and men.

Table - 3: Comparison of men and women of knee jointpain among women and men

Level of Knee Joint Pain	Median	Sum	Paired T value	P Level	Remarks
Women	78.000	1448.000	2.000	P < 0.01	Significant
Men	22.000	685.000			

Fig 1: Knee pain level compared between women and men.

The above table shows that in the men median score of knee joint pain level was 22.000 with sum of 685.000 and women median was 50.000 with sum of 1448.000. The calculated paired t value 2.000 was found to be statistically significant at P < 0.01 level which clearly shows men scores are significantly less than the women scores. Hence, the

study is effective.

Discussion:

The study was conducted to assess on knee joint pain among women and men in rural areas of Chennai. 100 women and men participants selected for the study, 50 were in women and men group was conducted for both groups by using self-structured questionnaire was given for the women and men group and after even days post test was conducted for both groups. In the experimental group, the majority of study participants (43.33%) belonged to the age group of 70-74. From table 1, among them, 56.67% were females, and 70.0% were engaged in sedentary work. In terms of weight, 43.33% were classified as obese, 30.0% were overweight, and 80.0% followed a non-vegetarian diet. Additionally, 70.0% did not engage in any form of exercise, 80.0% had no family history of knee joint pain, and none of them were currently taking medications for knee joint pain. On the other hand, in the control group, the majority of participants (40.0%) were in the age group of 70-74. Among them, 60.0% were females, 53.33% resided in urban areas, and 63.33% were involved in sedentary work. Regarding weight, 40.0% were classified as obese, 36.67% were overweight, and 67.0% had a normal weight. Furthermore, 19.0% followed a vegetarian diet, 70.0% did not engage in exercise, 90.0% had no family history of knee joint pain, and 26.67% had received medical treatment for knee joint pain in the past.

Table 2 presents the distribution of pre-test levels of knee joint pain in the women and men group. Among the participants, the majority (46.7%) reported severe pain, 40% had moderate pain, and 6.7% experienced mild pain. In contrast, in the men group, 39.7% had moderate pain, and 41% reported mild pain. The discussion of the study findings was based on the objectives, a review of the literature, and the null hypothesis specified in the study. Furthermore, the frequency and percentage distribution of demographic variables within the wmen were also considered. As a result, the study accepted the alternative hypothesis (H1), which stated that there is a significant difference in the level of knee joint pain between the women group and the men group.

Table 3 presents a comparison of pre-test and post-test levels of knee joint pain among the women and men group. The pre-test median was 78.00, with a sum of 148.000, while the post-test median was 22.000, with a sum of 685.000. The calculated paired t-value of 2.000 was found to be statistically significant at a significance level of $P < 0.01$. This result clearly indicates a significant reduction in knee joint pain among the study participants in the women and men group. These findings are supported by a similar study conducted by Jin-Tao Liu in

2013. The study protocol involved a multicentre randomized, double-blind, placebo-controlled trial with 320 participants aged 45 to 79 years who had knee osteoarthritis and reported scores on a visual analogy scale (VAS) greater than 20 mm. The participants were randomly assigned to a women and men group. The treatment group received a golden plaster externally for a period of 2 weeks, while the control group received a placebo plaster externally for the same duration. Follow-up assessments were conducted at regular intervals over a 4-week period, evaluating the VAS score for pain, quality of life, and complications. This study aimed to assess the pain relief effects of the golden plaster intervention compared to the placebo intervention in patients with knee osteoarthritis. The study design was methodologically sound, utilizing a randomized controlled trial approach.

Conclusion:

In conclusion, this comparative study aims to provide a comprehensive assessment of knee joint pain comparatively among elderly men and women. By examining gender-based differences in prevalence, severity, contributing factors, and functional limitations, this study can contribute to a better understanding of knee joint pain in the elderly population of women from the rural area in Chennai. The findings will have implications for healthcare professionals and policymakers in designing targeted interventions to alleviate knee joint pain and improve the well-being of elderly individuals.

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