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Likelihood of Impact of Knee Joint Pain on ADLS among Older Adult Population

Anum Safeer[1], Anam Liaqat[1], Fatima Riaz[2], Arisha Shafiq[3], Zainab Sabir[4], Meesha Rao[4]

Riphah International University, Lahore Campus[1], Foundation University College of Physical Therapy[2], Shifa Tameer-e-Millat University[3], National University of Medical Sciences[4]

Corresponding Email: anumsafeer@yahoo.com

Abstract

Background: Evidence reported that the beginning of knee discomfort and restrictions in physical function in older persons are closely related and impact their well-being. Therefore, this study intended to determine the association between knee discomfort and functional restrictions among older adults.

Methods: A cross-sectional survey was conducted among community-dwelling older adults with knee pain using a questionnaire that included daily living activities such as getting up from a sitting posture, climbing stairs, and walking. The responses were analyzed to determine the likelihood of knee pain impact on these tasks.

Results: The findings revealed a significant likelihood ($p<0.05$) between pain intensity and difficulty performing daily living tasks. The data analysis provided evidence that (n=74) participants with mild to severe pain in the knee joints had reported mild difficulty in standing from a sitting position, whereas (n=90) had difficulty in walking and (n=77) had difficulty in climbing stairs.

Conclusion: The findings of this study showed a significant association ($p<0.001$) between participant's capacity to perform daily living activities with mild to moderate knee pain. Thus, it becomes evident that patients with knee pain discomfort, either mild or moderate, will have to face significant difficulties in performing tasks like sitting, walking or ascending stairs.

Keywords

Activities of Daily Living, Pain, Sitting, Stair Climbing, Walking.

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Introduction

The knee joint functions as a synovial hinge joint and depends on the surrounding genicular anastomoses for a steady blood flow supplied by branches from the femoral and popliteal arteries[1]. Four bursae are housed within this complex joint, with the suprapatellar bursa extending the synovial cavity of the knee. However, studies including knee pain and Osteoarthritis (OA) provide striking disparity[2-3]. These two have a convoluted and far from easy connection, as research has revealed a wide range of discordance. While some persons have knee pain but no visible OA on X-rays, others have OA but no knee discomfort[4]. This puzzling contradiction casts doubt on comprehension of knee health. Researchers have examined the relationship between knee OA, knee discomfort, and the capacity to do Activities of Daily Living (ADLs) in more detail.

Interestingly, a small percentage of those 50 and older who experienced knee pain in the previous year sought medical assistance[5-6]. This emphasizes the necessity for a more thorough investigation of this complex interaction. Community-based research can provide a more objective analysis and precise insights into the association[7]. Knee discomfort has occasionally been identified as a significant cause of ADL reliance in older persons in our communities. Many persons aged fifty and beyond experience knee discomfort for one year, making it a notable concern in health and ageing[8-9]. The answer to understanding the long-term well-being of elders lies in this pervasive problem. According to a study, the beginning of knee discomfort and restrictions in physical function in older persons are closely related. The forecast presents a compelling future scenario[10]. Due mainly to its link to impaired physical function, knee pain is a reliable predictor of reliance and impairment[11]. People with generalized knee pain typically have more severe symptoms and have more difficulty carrying weight.

On the other hand, those with medial knee joint discomfort may score higher in physical functioning but experience more pain while standing. Interestingly, both groups display similar illness severity and traits associated with psychosocial components despite these disparities in symptom presentation and functional abilities[12-13]. This contradictory result highlights the nuanced effects of knee discomfort on older persons' quality of life[14-15]. This evidence led to the conduct of this cross-sectional study to delve into the insights on the impact of knee joint pain on performing activities of daily living in the older adult population to determine the association between knee discomfort and functional restrictions with overall well-being. By exploring these factors, we intend to open the door for more focused support systems and treatments that can raise the quality of life for our ageing population.

Methodology

A cross-sectional research approach was used for this study. Using Raosoft, the sample size was calculated with a 95% confidence interval and a 5% margin of error, yielding a sample of 249 people. The target group, which comprised people 50 years of age and older with knee discomfort, was chosen using a practical probability convenience sampling approach.

Inclusion/ Exclusion Criteria

The following criteria were used to include participants in the study:

- Fifty years of age or older.
- Those who have knee discomfort.
- Patients having osteoarthritis diagnosis.

Exclusion Standards

However, those who satisfied the following requirements were not included in the study:

- Age of less than forty years.
- Any patients with autoimmune disorders.
- Individuals with cancerous tumors.
- Those who have had traumatic arthritis in the past.

Data Collection and Analysis

A questionnaire with two essential components was used to collect the data for this investigation. While the second segment evaluated crucial ADLs, including getting up from a sitting posture, mounting stairs, and walking, the first section concentrated on collecting demographic data from the individuals. Katz's ADLs instrument inspired a self-created instrument to assess various ADLs. The gathered data were subsequently subjected to analysis using SPSS version 21. The development of suitable frequency tables and graphical representations allowed the transformation of qualitative and demographic data into formats that could be analyzed. For quantitative data, statistical techniques such as the chi-square test and standard deviation were used to analyze the findings, identifying pertinent data ranges and calculating averages and minimum and maximum values.

Results

A total number of n=249 participants with a mean age of 51.49±9.3 were recruited in the study. Demographic characteristics revealed that of the total number of participants, n=156 were female, and n=93 were male. Further analyses showed that n=96 participants complained of mild pain, n=78 complained of moderate pain, n=45 reported no pain, whereas n=30 complained of severe pain. A detailed description of the demographic characteristics of participants is illustrated in Table-1:

Table-1 Demographic description of participants included in the study	
Variables	**n (%)**
Age (Mean ± SD)	51.49±9.3
Gender	
Male	*156 (62.7%)*
Female	*93 (37.3%)*
Severity of Pain	
No pain	*45 (18.1%)*
Mild	*96 (38.6%)*
Moderate	*78 (31.3%)*
Severe	30 (12)
Occupation	
Retired	*23 (9.2%)*
Employed	*68 (27.3%)*
Entrepreneur	*37 (14.9%)*
Housewives	*121 (48.6%)*
Body Mass Index	
Underweight	*29 (11.6%)*
Normal	*75 (30.1%)*
Overweight	*72 (28.9%)*
Obese	*73 (29.3%)*

Table-2 depicts the effects of stability exercises on the functional disability level of patients after 12 weeks of intervention. The results revealed a positive impact on disability level, with a mean value of 26.34 at baseline reduced to 16.23 with a mean difference of 10.11. The fact that the $p<0.05$ suggests that this mean difference is statistically significant, providing strong evidence to reject the null hypothesis that the intervention has no effect. In practical terms, this means that the observed decrease in disability levels is unlikely to be due to random chance alone. Further, Chi-square analyses were performed to determine the likelihood of knee joint pain affecting the

activities of ADLs, mainly while performing three primary activities: sitting, walking and climbing. The findings revealed a significant likelihood $p<0.05$ between the intensity of pain and difficulties in performing standing from sitting, walking, and stair climbing. The data analyses provided evidence that many of the participants with mild to severe pain in the knee joint had reported mild difficulty in standing from a sitting position, n=74, whereas n=90 reported difficulty in walking and n=77 had reported difficulty in climbing stairs. A detailed illustration of the findings is provided in Table-2.

Table-2 Chi-square analyses for determining the likelihood of intensity of knee pain affecting ADLs

Variables	Position (ADLs) Rising from sitting position					
	Limited	Mildly Affected	Normal	X^2 Value	Likelihood ratio	p-value
Pain Intensity						
No Pain	2	6	37	51.747	49.062	<0.001
Mild	12	34	50			
Moderate	15	32	31			
Severe	16	2	12			
Total	45	74	130			
	Position (ADLs) Walking					
No Pain	0	6	39	32.177	36.68	<0.001
Mild	8	39	49			
Moderate	12	37	29			
Severe	2	8	20			
Total	22	90	137			
	Position (ADLs) Walking					
No Pain	0	2	10	53.101	53.789	<0.001
Mild	2	32	26			
Moderate	2	30	29			
Severe	4	10	12			
Total	8	74	77			

Discussion

There were 249 participants in the research; 156 were women (37.3%), and 93 were men (62.7%). Chi-square analyses were used in the study to determine how knee joint pain affected certain ADLs, such as sitting, walking, and ascending stairs. The results showed a significant correlation ($p<0.001$) between the severity of knee discomfort and the difficulty completing ADLs. Participants who experienced mild to severe knee pain, in particular, said they had trouble doing ADLs. Getting up from a seated position was particularly challenging for 74, who reported mild difficulties. The ability to walk was also affected; 90 participants had trouble with it, and 77 people had trouble ascending stairs. These findings illustrate the significant impact of knee pain severity on ADLs, emphasizing the challenges people encounter while doing fundamental tasks like getting up from a sitting posture, walking, and mounting stairs while experiencing knee pain, even at mild to moderate levels of severity. This implies the significance of dealing with knee pain and its management to enhance the quality of life for people who experience such discomfort. A baseline survey was conducted in 2012, and a follow-up survey in 2014. The Medicare Health Outcomes Survey Cohort 15 provided data on nearly 164,000 older persons in the United States who are 65 years of age and older[16]. The study aimed to determine the frequency of falls, identify risk factors for new falls, and investigate the effects of falls and balance or walking problems on one's health. Findings showed that about 23% of individuals had fallen, while 34% said they had had balance or walking issues the previous year. Past fall occurrences and balance/walking issues were the best predictors of falls[16]. Additionally, albeit to a lesser extent, several chronic illnesses, geriatric symptoms, and restrictions on everyday activities also contributed to falls. Compared to balance/walking issues, falls were linked to a small decline in health-related quality of life (HRQOL) ratings and a greater increase in mortality. Quality-adjusted life years (QALYs) decreased by 48% due to falls and an even greater 62% due to balance/walking issues. These findings highlight the substantial burden that balance/walking problems and falls place on older Americans, emphasizing the urgent need for preventative measures and treatments as the aged population continues to rise[16]. Another cohort research with 333 community-dwelling participants aged 70 years and older, with a small majority of women (52%), sought to explore potential mediating variables and examine the association between knee pain and falls[17]. The study discovered that 36% of individuals had knee pain, and this group had more medical issues and greater drug use than those who did not report knee pain. The pain group also had worse strength, balance, and physical function and expressed greater worry about falling. In the 12-month follow-up period, 20% of individuals reported two or more falls, with the pain group having a twice as high likelihood of doing so (Relative Risk = 2.0, 95% Confidence Interval = 1.27-3.13)[17]. Three substantial and distinct mediators of fall risk—concern about falls, knee extension torque, and postural sway with eyes closed—were found to explain 23% of the association between knee discomfort and falls. The findings of this study focused on the crucial role of knee pain and its determinants in falls among community-dwelling older adults and showed the significance of its management[17].

A study was conducted on the Indian elderly population to determine the prevalence and risk factors for joint and bone illness and their association with falls. The data was extracted from a

longitudinal ageing study in India (2017 to 2018), which included a cohort of 31,464 older individuals. Results revealed that women were more likely to have bone and joint problems than males, which affected close to 20% of older persons. Moreover, their current occupation, sedentary lifestyle, functional limitations and greater socioeconomic level were significant predictors of these disorders. Thus, a strong association between bone and joint illnesses and falls was established, even after controlling for several confounders like sociodemographic and health-related characteristics. Furthermore, 12.63% of older persons reported falling during the previous two years. This emphasizes the significance of policymakers and healthcare professionals implementing interventions to lower the risk of bone and joint diseases, particularly knee pain intensity affecting ADLs, among the elderly population, as addressing these issues can help mitigate the risk of falls and improve older people's overall quality of life[18]. The study's main feature is its assessment of the effects of knee joint pain on ADLs across a sizable sample of 249 older persons, which offers essential new information on this crucial topic. The study tackles a crucial part of the well-being of the ageing population by looking at the possibility that knee joint discomfort would impair ADLs. The study's main weakness, though, was its small sample size, which does not adequately reflect the variety of experiences that older persons have. Moreover, this study highlighted the potential impact of knee joint pain and its consequences on daily living studies; however, more meticulous information on its management needs more research on the tailored interventions in the older adult population and musculoskeletal pain.

Conclusion

The findings of this study showed a significant association ($p<0.001$) between participant's capacity to perform daily living activities with mild to moderate knee pain. Thus, it becomes evident that patients with knee pain discomfort, either mild or moderate, will have to face significant difficulties in performing tasks like sitting, walking or ascending stairs. Thus, early and efficient intervention is crucial to reduce the impact of knee pain to improve the physical well-being of the older population.

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Conflict of Interest

None.

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None.

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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: Safeer A

Acquisition, Analysis or Interpretation of Data: Liaquat A, Riaz A, Shafiq A

Manuscript Writing & Approval: Sabir Z, Rao M

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.