

AGING IN ACTION: LINKING DAILY ACTIVITIES WITH OSTEOARTHRITIS RISK IN MIDLIFE

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Abstract

Introduction: Osteoarthritis (OA) is a progressive degenerative joint disease characterized by cartilage breakdown, changes in the underlying bone, and inflammation of surrounding soft tissues. It is among the most common forms of arthritis, primarily affecting older adults. **Aim:** To assess the activities of daily living (ADL) and the risk of osteoarthritis among middle-aged adults in Tiruvallur. **Objectives:** The study aims to assess the activities of daily living and the risk of osteoarthritis among middle-aged adults. It also seeks to compare ADL and OA risk between men and women, determine the correlation between ADL and OA risk, and examine the association of ADL and OA risk with selected demographic variables. **Methods:** A descriptive research design was used. A total of 100 participants (50 men, 50 women) were selected via purposive sampling. Data were collected using the WOMAC and Katz scales to assess ADL and OA risk. Health education was provided to all participants. **Result:** Among women, 28 (56%) had average OA risk, 14 (28%) had low risk, and 8 (16%) had high risk. Among men, 27 (54%) had low risk, 21 (42%) had average risk, and 2 (4%) had high risk. The chi-square value of 9.722 was significant at $p < 0.05$ between men and women. A mild negative correlation between OA risk and ADL was observed. **Conclusion:** The study demonstrates a significant difference in OA risk between men and women. A decrease in ADL is associated with an increased risk of osteoarthritis among middle-aged adults.

Introduction

Osteoarthritis (OA) is a chronic degenerative joint disease characterized by the gradual deterioration of cartilage, structural changes in the bones, and inflammation of the surrounding soft tissues. It commonly affects weight-bearing joints such as the knees and hips, as well as the hands and spine, particularly among older adults. As the global

population continues to age, the prevalence of OA is steadily increasing, resulting in a major physical, psychological, social, and economic burden on individuals and healthcare systems. The condition is commonly associated with pain, stiffness, swelling, and reduced joint mobility, which progressively impair an individual's ability to

perform activities of daily living (ADLs) such as bathing, dressing, cooking, walking, and household tasks. These functional limitations often lead to dependency on caregivers, decreased quality of life, and psychological problems such as anxiety, depression, and social isolation.

Multiple factors contribute to the development and progression of OA. These include advancing age, female gender, particularly among postmenopausal women, obesity, previous joint trauma, hereditary predisposition, and unhealthy lifestyle practices such as inadequate physical activity, poor nutrition, and repetitive stress on joints. As OA progresses, individuals may experience severe difficulty in carrying out routine activities, thereby increasing the need for long-term medical care and rehabilitation. The resulting functional impairment not only affects the individual but also imposes a significant burden on family members and healthcare services due to increased risks of falls, disability, hospitalization, and prolonged rehabilitation.

According to the World Health Organization, OA affects nearly 528 million people globally, with the majority being adults above 55 years of age and women constituting a higher proportion of affected individuals. The knee joint is reported to be the most commonly involved site. In India, OA is recognized as a major public health concern, affecting more than 62 million individuals. The prevalence of knee OA in the country is estimated to be around 28.7%. States such as Uttar Pradesh, Maharashtra,

and West Bengal report a high burden of OA, while Kerala, Goa, and Rajasthan show high age-standardized prevalence rates. OA also contributes significantly to years lived with disability (YLDs) in India, affecting the overall productivity and well-being of the population. In Tamil Nadu, studies conducted in rural regions such as Kanchipuram District have reported a high prevalence of knee OA, particularly among women and adults above 50 years of age. Contributing factors identified in these studies include obesity, sedentary lifestyle, and positive family history. Furthermore, disability-related activity limitations have been reported among the rural elderly population. OA is increasingly being observed among middle-aged adults between 45 and 65 years, where early symptoms are often neglected until considerable functional impairment develops. Therefore, evaluating the association between the severity of OA and the performance of activities of daily living is essential for facilitating early diagnosis, timely management, and prevention of disability.

Community-based interventions such as exercise therapy, weight reduction programs, ergonomic modifications, health education, and early screening initiatives play a vital role in the prevention and management of OA. These measures can help maintain functional independence and improve overall quality of life among affected individuals. In addition to physical limitations, the psychosocial consequences of OA must also be considered, as chronic pain and reduced mobility may contribute to

emotional distress, loneliness, and social withdrawal. This study emphasizes the importance of early identification, community-oriented healthcare strategies, and targeted public health policies to minimize OA-related disability and enhance the well-being of middle-aged and elderly populations. The novelty of the study lies in its focus on examining the relationship between OA severity and activities of daily living within a community setting, thereby providing valuable insights for preventive, rehabilitative, and supportive healthcare planning.

Objectives

The study aims to assess the activities of daily living and the risk of osteoarthritis among middle-aged adults. It also seeks to compare ADL and OA risk between men and women, determine the correlation between ADL and OA risk, and examine the association of ADL and OA risk with selected demographic variables.

Hypotheses

H₁: There is a significant difference in the activities of daily living, risk osteoarthritis among middle aged men and women at $p < 0.05$.

H₂: There is a significant relationship between the activities of daily living and risk of osteoarthritis among middle aged adults at $p < 0.05$.

H₃: There is a significant association of the activities of daily living and risk of

osteoarthritis among middle aged adults with selected demographic variables at $p < 0.05$.

Materials & Methods

A descriptive cross-sectional research design was employed to assess the activities of daily living and the risk of osteoarthritis among middle-aged adults residing in Pappampakkam, Chennai. The study was conducted over a period of one month, from 12.09.2024 to 12.10.2024, among 100 middle-aged adults who satisfied the predetermined inclusion criteria. The target population comprised adults aged between 40 and 59 years from a selected rural community. Participants were selected using a non-probability purposive sampling technique.

Data collection was carried out using a standardized and structured questionnaire formulated on the basis of an exhaustive review of related literature and consultation with subject experts. The instrument encompassed sections pertaining to socio-demographic characteristics, the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and the KATZ Index of Activities of Daily Living. The tools were appropriately validated for local applicability and administered in the English language. Ethical approval for the study was obtained from the Institutional Ethics Committee of A.C.S Medical College and Hospital, Vellappanchavadi (IEC No. 1261/2024/IEC/ACSMCH dated 05.07.2024), prior to the commencement of data collection.

Results & Discussion

The findings of the present study revealed that the majority of middle-aged adults were within the age group of 56–59 years, accounting for 18(36%) women and 26(52%) men. All participants in both groups were married. A substantial proportion of women 20(40%) and men 26(52%) had no formal education. The majority of women 43(86%) and men 40(80%) were employed as laborers. With regard to monthly family income, most women 31(62%) earned below Rs. 5000 per month, whereas the majority of men 24(48%) reported an income between Rs. 10,001–15,000. In terms of occupational experience, 18(36%) of women had less than 10 years of work experience, while 16(32%) of men had 20-30 years and 30-40 years of working experience. Most women 35(70%) and men 33(66%) were identified as moderate workers. The majority of women 48(96%) and men 43(86%) reported prolonged standing for at least two hours during work. Among women, 36(72%) had attained menopause. All participants reported no prior history of joint disease. Regarding personal habits, all women and 21(42%) of men reported no personal habits. The majority of women 47(94%) and men 46(92%) consumed a non-vegetarian diet. Most women 36(72%) and men 46(92%) had not taken calcium and vitamin D3 supplements. Nearly all participants 46(92%) maintained a normal BMI. The majority of women 40(80%) and men 45(90%) had no family history of osteoarthritis, whereas 36(72%) of women and 29(58%) of men had associated comorbidities.

The study clearly established that the majority of middle-aged women 47(94%) and men 48(96%) were independent in performing activities of daily living (ADL). With regard to the risk of osteoarthritis, more than half of the women 28(56%) demonstrated an average level of risk, while 14(28%) had low risk and 8(16%) had high risk. In comparison, the majority of men 27(54%) exhibited low risk, followed by 21(42%) with average risk and only 2(4%) with high risk of osteoarthritis. Comparative analysis confirmed that there was no statistically significant difference in ADL between middle-aged women and men, as indicated by the chi-square value ($\chi^2 = 0.211$, $p < 0.05$). However, a statistically significant difference was identified in the risk of osteoarthritis between men and women ($\chi^2 = 9.722$, $p < 0.05$), indicating that women were more likely to experience an average risk of osteoarthritis, whereas men predominantly demonstrated low risk.

The correlation analysis conclusively demonstrated a significant negative relationship between activities of daily living and the risk of osteoarthritis. Among women, the mean scores of ADL and osteoarthritis risk were 5.92 ± 0.34 and 42.58 ± 20.83 respectively, with a mild negative correlation ($r = -0.393$, $p < 0.05$). Similarly, among men, the mean scores of ADL and osteoarthritis risk were 5.95 ± 0.19 and 24.0 ± 23.79 respectively, with a mild negative correlation ($r = -0.312$, $p < 0.05$). These findings clearly indicate that reduced functional ability was associated with increased osteoarthritis risk. Furthermore, pain, stiffness, and difficulty

among women demonstrated statistically significant negative correlations with ADL, confirming that increased symptom severity adversely affected functional independence. Among men, pain and difficulty also showed statistically significant negative correlations with ADL, while stiffness exhibited a negative but statistically non-significant correlation.

The association analysis further demonstrated that several demographic variables had a significant influence on activities of daily living and the risk of osteoarthritis. Among women, years of working experience, occupation, and family history of osteoarthritis showed statistically significant associations with ADL. Among men, duration of standing and BMI were significantly associated with ADL. In relation to osteoarthritis risk among women, age, menopausal status, and family history of osteoarthritis demonstrated statistically significant associations. Among men, prolonged standing hours, presence of comorbidities, and lack of calcium and vitamin D3 supplementation showed statistically significant associations with osteoarthritis risk. These findings strongly emphasize that occupational factors, physiological changes, nutritional practices, comorbid conditions, and hereditary influences play a decisive role in determining both functional ability and the risk of osteoarthritis among middle-aged adults.

Conclusion

The present study effectively assessed the risk of osteoarthritis and the

level of activities of daily living among middle-aged adults. The findings revealed that although the majority of participants remained independent in performing activities of daily living, women demonstrated a comparatively higher risk of osteoarthritis than men. The study further established a significant mild negative correlation between activities of daily living and the risk of osteoarthritis, indicating that a decline in functional ability was associated with an increased risk of developing osteoarthritis.

The study also identified several demographic and occupational factors that significantly influenced both activities of daily living and osteoarthritis risk. Variables such as years of working experience, prolonged standing hours, occupation, and BMI showed significant associations with functional independence, while age, menopausal status, family history of osteoarthritis, comorbidities, and lack of calcium and vitamin D3 supplementation were significantly associated with increased osteoarthritis risk. These findings emphasize that occupational strain, physiological changes, hereditary predisposition, and lifestyle practices contribute substantially to the development and progression of osteoarthritis during middle age.

Furthermore, the study highlights the importance of early identification and preventive strategies among middle-aged adults, particularly women who are more vulnerable to osteoarthritis due to age-related and hormonal factors. Early screening

programs, periodic musculoskeletal assessments, and health education initiatives can play a vital role in identifying individuals at risk before significant functional impairment occurs. Lifestyle modifications such as maintaining optimal body weight, engaging in regular physical exercise, improving nutritional intake, adopting ergonomic work practices, and ensuring adequate calcium and vitamin D3 supplementation may help reduce the progression of osteoarthritis and preserve functional independence.

Overall, the findings of the study strongly emphasize the need for comprehensive preventive and rehabilitative interventions aimed at promoting healthy aging, improving quality of life, and minimizing disability associated with osteoarthritis among middle-aged adults. The study also underscores the important role of healthcare professionals, particularly nurses, in creating awareness, providing health education, encouraging early intervention, and supporting individuals in adopting healthier lifestyle behaviors to reduce the burden of osteoarthritis in the community.

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