OPEN ACCESS

ORIGINAL ARTICLE

DOI: https://doi.org/10.69723/njms.05.01.0685

DISTRIBUTION OF MAJOR JOINT DISORDERS AND ASSOCIATED FACTORS AMONG ADULTS IN TERTIARY CARE SETTINGS OF PESHAWAR: A CROSS SECTIONAL STUDY

Mirza Mabroor Ahmad[1], Khadija Nowaira Abdullah[2], Bibi Aliya[2], Shahab Ud Din Awan[1], Aqsa Qasim[1], Amina Khursheed[1]

1. MBBS student, Rehman Medical College, Peshawar, Pakistan

2. Department of Community Medicine & Public Health, Rehman Medical College, Peshawar, Pakistan

Correspondence Email: Khadijanowaira72@yahoo.co.uk

Received; 18th December '25, Revisions received; 24th February '26, Accepted; 5th March'26

ABSTRACT

BACKGROUND: Joint disorders are a major yet under-recognized public health challenge, contributing substantially to disability, reduced quality of life, and long-term healthcare costs. In low-resource countries like Pakistan, their impact is magnified by a high burden of comorbidities. Detailed information on their patterns, especially in busy tertiary care settings, remains limited here. The lack of local evidence makes it difficult to design effective prevention and care strategies.

OBJECTIVE: To determine the distribution of major joint disorders and associated factors among adults attending tertiary care hospitals in Peshawar, Pakistan, and to assess the comorbidity burden in this population.

METHODOLOGY: It was a cross-sectional study conducted from June to November 2022 in four tertiary care hospitals of Peshawar. A sample of 400 patients aged ≥18 years diagnosed with joint disorders was recruited by non-probability convenience sampling. Data were collected using a structured questionnaire covering demographics, lifestyle factors, clinical diagnosis, and comorbidities. Data analysis was performed using SPSS-26, with results presented in tables as frequencies and percentages.

RESULTS :The mean age of the sample was 54±13.06 years, with 54.5% males and 45.5% females. Osteoarthritis was the most common disorder (35%), followed by gout (27.5%) and rheumatoid arthritis (24.5%). Gout was predominant in males (37%), while osteoarthritis was more frequent in females (45%). Most of the subjects were married (75%), non-smokers (68%) and belonged to middle-income category (58.5%). Majority of them did not have family history of joint disorder (76%) or history of prior trauma (66%). A high comorbidity burden was observed and 92% of the participants reported comorbidities, most common being hypertension (54%) and diabetes mellitus (22.5%).

CONCLUSION: There is a high burden of osteoarthritis and gout among adults in tertiary care settings in Peshawar, compounded by a very high rate of comorbidities. These findings underscore the need for integrated, preventive public health strategies and multidisciplinary care models for joint disorders in Pakistan.

KEYWORDS :Rheumatoid arthritis, Osteoarthritis, Gout, Comorbidity, Pakistan

HOW TO CITE THIS ARTICLE: Ahmad MM, Abdullah KN, Aliya B, Awan SUD, Qasim A, Khursheed A. Distribution of major joint disorders and associated factors among adults in tertiary care settings of Peshawar; a cross sectional study. Northwest J Med Sci. 2026 ;5(1).41-46

INTRODUCTION

Joint diseases, including Osteoarthritis, Rheumatoid arthritis, gout, and septic arthritis, are an important category of Non-Communicable Diseases (NCDs)[1] characterized by the inflammation, structural damage, and functional impairment of the musculoskeletal system. These diseases cause chronic pain, stiffness, reduced mobility, and progressive disability, fundamentally undermining an individual's physical capability and independence. Lifelong, often degenerative conditions, joint diseases require ongoing clinical care, rehabilitation, and often surgery, thus providing a continuing source of co-morbidity for those affected and a multifaceted burden on health systems.[2]

The burden of musculoskeletal disorders, with joint conditions at its core, continues to be enormous and rising globally. The Global Burden of Disease 2021 study reiterated the fact that musculoskeletal disorders remain a leading contributor to years lived with disability (YLDs) worldwide. Osteoarthritis and rheumatoid arthritis are emerging again among the top contributors to global disability.[3] This trend has been exaggerated in Low and Middle Income Countries (LMICs) such as Pakistan, which face a double burden of disease. With increasing life expectancy and risk factors, including obesity and physical inactivity, there is an increasing prevalence of NCDs superimposed upon persistent infectious disease pressures.[4] In Pakistan, community-based surveys have testified to the high prevalence of musculoskeletal pain, with several studies indicating that a considerable proportion of adults, particularly women and the elderly, report chronic joint problems.[5] However, there is no nationally representative data on the exact distribution and determinants of diagnosed joint disorders, and the profile from high-patient-volume settings such as tertiary hospitals in Khyber Pakhtunkhwa remains poorly characterized.[6]

Major joint disorders have an impact on public health that goes way beyond clinical diagnosis and has a great impact on the quality of life of people and their economic stability. These disorders are firmly linked to low Health-Related Quality of Life

(HRQoL), which negatively affects mental health, sleep, social participation, and the ability to carry out basic activities of living and vocational tasks.[7-8] The resultant functional decline leads to absenteeism from work, or early withdrawal from active employment with sizeable indirect costs to households and the economy. For health systems, the direct costs of lifelong pharmacotherapy, advanced imaging specialist consultations, and joint replacements are sizeable and increasing.[9] The most serious and compounding features are high comorbidity rates. Patients with joint diseases often have co-existing NCDs like hypertension, diabetes, and CVD, generating complex clinical management, increasing risks of polypharmacy, and leading to poor overall health outcomes.[10-11] A syndemic contribution of disease, hence, means that there is a need to shift away from a disease-oriented model to comprehensive integrated, person-centered-care models in public health.

Despite the clear importance, there is a significant gap in evidence in Pakistan, more so in the northwestern part of the country. The available literature from Khyber Pakhtunkhwa (KPK) usually cites either surgical outcomes or the pain epidemiology in community-based studies without going into detailed etiological classification and lifestyle and socioeconomic factors of the population attending the tertiary health facilities.[12-13]Tertiary care hospitals are a sentinel site to assess not only the advance burden of diseases but also the complexity of cases and the inter-section of joint disorders with severe comorbidities.[14] This constitutes vital information for health system preparedness and the designing of targeted interventions.[15] Hence, the current study was designed to fill this gap. The key objective was to identify the distribution of major joint disorders and frequency of known risk factors among adults attending tertiary care hospitals in Peshawar, KPK. This research aims at generating actionable evidence by identifying the prevalent joint disorders and the modifiable risks like body mass index (BMI) and smoking, and by detailing the comorbidity landscape, the information could underpin public health strategies, inform clinical practice guidelines, and advocate resource apportioning for integrated NCD management in the region.

METHODOLOGY

This cross-sectional study was conducted from June to November 2022 in two public and two private tertiary care hospitals in Peshawar, KPK: Rehman Medical Institute (RMI), Northwest General Hospital (NWGH), Hayatabad Medical Complex (HMC), and Khyber Teaching Hospital (KTH). The former two are private, while the latter two are public hospitals.

The sample comprised of the patients diagnosed with any joint disorder, visiting the outpatient department (OPD) and those admitted at the wards of the Orthopedic units of the selected hospitals. Raosoft sample size calculator was used to calculate the sample size which came out to be 370 with a 95% confidence interval, 5% error and 40% expected prevalence, this value was rounded up to 400. Non-probability convenience sampling technique was used. Patients aged 18 years and above from both genders were included in the study. Whereas, Patients needing emergency treatment and unwilling individuals were excluded from the study.

Dependent variables: Types of joint disorders (osteoarthritis, rheumatoid arthritis and gout)

Independent variables: Age, gender, BMI and comorbidities

Formal permission to conduct the study was taken from the respective administrators of the included hospitals. Data was collected using a structured questionnaire. The questionnaire included questions related to demographic profile, life style indicators, diagnosis and the comorbidities. Weight was measured in Kilograms and height in centimeters (later converted to meters) to calculate the Body Mass Index (BMI) for each subject. Data analysis was done using SPSS-26 software. Frequencies and percentages were estimated.

High Income Category: Available family income of more than PKR 100,000 per month

Middle Income Category: Available family income PKR 50,000 - 100,000 per month

Low Income Category: Available family income of less than PKR 50,000 per month

Underweight = < 18.5 BMI

Normal weight =18.5-24.9 BMI

Overweight = 25-29.9 BMI

Obesity = $\geq$ 30 BMI

Ethical approval was obtained (RMC/CMPH-REC/Approval-30.05.22) from ethical review board of Rehman Medical College, Peshawar, Pakistan

RESULTS

Total sample size was 400. The mean age of the sample was 54±13.06 years. As shown in table 1, out of the 400 participants who participated in this study 218 (54.5%) were males and 182 (45.5%) were females. 300 of the participants were married, 38 were divorced, 32 were single, and 30 were widowed. Majority (58.5%) of the subjects belonged to middle-income category.

Table 01: Demographic profile of the sample

Characteristics (N= 400)	Categories	Frequency	Percentage
Gender	Male	218	54.5%
	Female	182	45.5%
Marital status	Married	300	75%
	Single	32	08%
	Widowed	30	7.5%
	Divorced	38	9.5%
Financial status	Low income	68	17%
	Middle income	234	58.5%
	High income	98	24.5%
Occupation	Business	47	12%
	Manual worker	46	11.5%
	Public sector job	45	11%
	Private sector job	19	5%
	Student	49	12%
	Teacher	27	7%
	House wife	77	19%
	Unemployed	90	22.5%

As displayed in figure 1, the most common joint disorder was osteoarthritis with 140 (35%) diagnosed patients, of which 58 were males and 82 were females. Second on the list was gout and 110 subjects (27.5%) were diagnosed with it of which 80 were males and 30 were females. This was followed by rheumatoid arthritis with 98 (24.5%) diagnosed patients, septic arthritis (34 patients, 8.5%), spondylojoint disorders (12 patients, 3%), and other conditions (6 patients, 1.5%). Gout was the most commonly found joint disorder among the males (80 of 218, 37%) while osteoarthritis was the leading disorder in the case of females (82 out of 182, 45%).

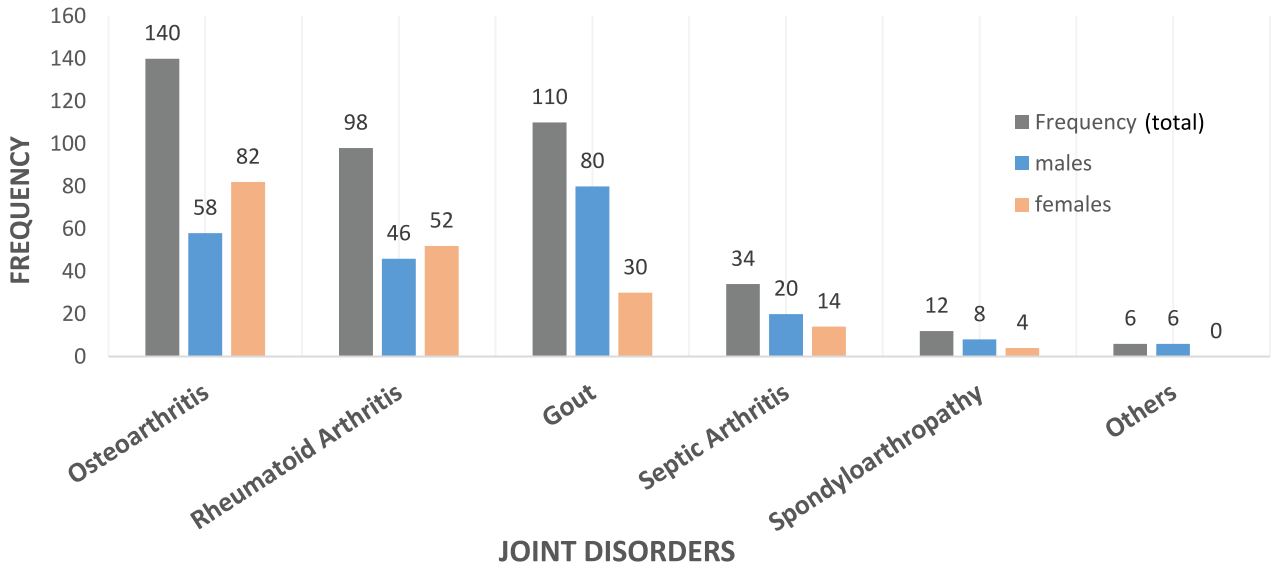

Figure 1. Distribution of joint disorders

As table 2 depicts, none of the females smoked as compared to males where 32% were smokers. A considerable portion of the participants (35.5%) had high BMI hence were overweight. Comorbidities were very common among the participants and 368 (92%) of the subjects suffered from a comorbid condition. Hypertension was highlighted as the most common comorbidity with 216 (54%) participants, followed by diabetes mellitus reported by 90 (22.5%) participants and autoimmune conditions affecting 16 (4%) of subjects. Ischemic heart disease (IHD),

Table 2. Risk factor profile of the participants

Characteristics	Categories	Frequency		Total Frequency (N=400)
		Males (N=218)	Females N=(182)	
Smoking status	Smokers	128 (59%)	None	128 (32%)
	Non-smokers	90 (41%)	182(100%)	272 (68%)
BMI	Normal	134 (61.5%)	118(65%)	252 (63%)
	Low	4 (2%)	2(1%)	6 (1.5%)
	High	80 (36.5%)	62(34%)	142 (35.5%)
Co-morbidities	Hypertension	122 (56%)	94 (52%)	216 (54%)
	Diabetes Mellitus	46 (21%)	44 (24%)	90 (22.5%)
	Autoimmune conditions	6 (2.7%)	10 (5.5%)	16 (4%)
	IHD	4 (2%)	8 (4.4%)	12 (3%)
	COPD	10 (4.4%)	2 (1%)	12 (3%)
	Osteoporosis	2 (0.9%)	6 (3.2%)	8 (2%)
	Others	4 (2%)	10 (5.5%)	14 (3.5%)
	None	24 (11%)	8 (4.4%)	32 (8%)
Family history	Yes	55 (25%)	40 (22%)	95(23.7%)
	No	163 (75%)	142(77%)	305(76.3%)
History of trauma	Yes	82 (37.6)	54 (29.6%)	136 (34%)
	No	136 (62.4%)	128(70.4%)	264 (64%)

DISCUSSION

This research offers a critical analysis on the importance of major joint disorders among the adult population in the tertiary health care system of Peshawar, Pakistan. The results obtained in this research clearly depict a certain epidemiological profile, where the predominant joint disorder is that of osteoarthritis (35%), followed by the unusually high prevalence of gout (27.5%), with rheumatoid arthritis (24.5%) following suit. The patients mostly belonged to the middle-aged category (mean age 54±13.06 years), who demonstrated a high prevalence level of comorbidities, with 92% of patients presenting with other chronic conditions, hypertension (54%) and diabetes mellitus (22.5%) being the leading diseases.

The prevalence of osteoarthritis is consistent with the national and international prevalence, which is the leading cause of joint-related disability.[16-18] The significantly high prevalence of gout, especially in men, with 37% being diagnosed, is, however, greater than the rate in the meta-analysis from Pakistan, which stood at 21.4%,[19] as well as a study in the Swat Valley (22.9%).[20] Similarly, lower prevalence (15.38%) has been reported in Nepal.[21] This is probably because the tertiary care setting is reflecting the tertiary cases, but it also seems that there is an unseen prevalence of hyperuricemia and metabolic syndrome in the population, which is consistent with the rising prevalence of sedentary lifestyle and NCDs in Pakistan. The high prevalence of gout in men, as well as the high prevalence of osteoarthritis in women is similar to the global prevalence, which is a reminder that a gender-sensitive perspective is necessary.[22-23]

When compared with the international literature, the prevalence of associated factors remains marked for magnitude. The high prevalence rate of overweight (35.5%) along with joint disorders is similar to that of other Low/Middle-Income Countries where there is an accelerated nutrition transition.[24] The exclusive reporting of cigarette smoking in men with joint disorders

indicates a serious, amenable factor that has been observed in neighboring countries like India and Bangladesh as well.[25-26] The high prevalence rate of comorbidities (92%) seems alarming, especially when compared with other similar literature from India,[27-28] where it has been reported to be much lower (42%-45%). This indicates that patients with symptomatic joint disorders are a vulnerable population in Pakistan, seeking care at a later stage when presenting to the already overburdened healthcare facilities.

The prevalence of comorbidities, particularly hypertension and diabetes, being a nearly universal phenomenon, shifts the paradigm from managing a single disease to multi-morbidities. The convergent presentation of a syndemic, thus, underlines the need for evidence-based care approaches, such as the Integrated Care for Older People (ICOPE) model[29] by World Health Organization (WHO), but with a replication for young adults in high prevalence regions.

The cross-sectional design of this study limits the ability to establish causality between joint disorders and associated risk factors. The use of non-probability convenience sampling from tertiary care hospitals is likely to introduce selection bias, therefore, the findings may not be generalizable to the broader community or primary care settings. Also, variables, including smoking status, family history, and history of trauma, were based on self-reported data, hence may be subject to recall bias.

CONCLUSION

This study highlights a high burden of joint disorders among adults in tertiary care settings of Peshawar, with osteoarthritis and gout predominating and an alarmingly high prevalence of comorbidities, particularly hypertension and diabetes. The findings emphasize the need for integrated, preventive, and multidisciplinary care approaches. It also hints at greater emphasis on early detection and risk factor control at primary and secondary healthcare levels to reduce disease burden. Larger community-based studies are recommended to better explore the association of risk factors with joint disorders.

CONFLICT OF INTEREST STATEMENT: The author should declare no conflict of interest related to this publication.

FINANCIAL DISCLOSURE STATEMENT: No financial support or external funding was received for the completion of this work.

REFERENCES

1.Nguyen AT, Aris IM, Snyder BD, Harris MB, Kang JD, Murray M et al. Musculoskeletal health: an ecological study assessing disease burden and research funding. The Lancet Regional Health–Americas. 2024 Jan 1;29:1-13. https://doi.org/10.1016/j.lana.2023.100661

2.Leifer VP, Katz JN, Losina E. The burden of OA-health services and economics. Osteoarthritis and cartilage. 2022 Jan 1;30(1):10-16. https://doi.org/10.1016/j.joca.2021.05.007

3.March L, Smith EU, Hoy DG, Cross MJ, Sanchez-Riera L, Blyth F et al. Burden of disability due to musculoskeletal (MSK) disorders. Best practice & research Clinical Rheumatology. 2014 Jun 1;28(3):353-366. https://doi.org/10.1016/j.berh.2014.08.002

4.Nguyen A, Lee P, Rodriguez EK, Chahal K, Freedman BR, Nazarian A. Addressing the growing burden of musculoskeletal diseases in the ageing US population: challenges and innovations. Lancet Healthy Longev. 2025;6(5):1-9. https://doi.org/10.1016/j.lanhl.2025.100707

5.Goswami N. A Dual Burden Dilemma: Navigating the Global Impact of Communicable and Non-Communicable Diseases and the Way Forward. Int J Med Res. 2024;1(1):65-77. https://doi.org/ 10.55489/ijmr.11202412

6.Ahmed H, Saeed MA, Attique F. The burden of musculoskeletal pain, associated sociodemographic factors, and disability in Pakistan. Int J Rheum Dis. 2024;27(1):1–8. https://doi.org/10.1111/1756-185X.14972

7.Feng JC, Yu L, Fang Y, Zhang X, Li S, Dou L. Correlation between disease activity and patient-reported health-related quality of life in rheumatoid arthritis: a cross-sectional study. BMJ Open. 2024;14(5):1–8. https://doi.org/10.1136/bmjopen-2023-082020

8.Alwhaibi M, Alhawassi TM. Mental health and health-related quality of life among adults with osteoarthritis: A national population-based study. PLoS One. 2025 Jun 18;20(6):1-14. https://doi.org/10.1371/journal.pone.0325780

9.Abdullah A, Alhashim A, Alyousof AA, Aldawsari MR, Alghannam AA, Alsayed MA, et al. Work-Related Musculoskeletal Disorders and their Impact on Quality of Life : A Comprehensive Review. Saudi J Med Pharm Sci. 2025;4929:360–377. https://doi.org/10.36348/sjmps.2025.v11i05.002

10.Gilcrease W, Manfredi L, Sciascia S, Ricceri F. From Multimorbidity to Network Medicine in Patients with Rheumatic Diseases. Rheumatol Ther . 2025;12(1):1–24. https://doi.org/10.1007/s40744-024-00724-8

11.Muckelt PE, Roos EM, Stokes M, McDonough S, Grønne DT, Ewings S et al. Comorbidities and their link with individual health status: A cross-sectional analysis of 23,892 people with knee and hip osteoarthritis from primary care. Journal of Comorbidity. 2020 May 8;10:1-11. https://doi.org/10.1177/2235042X209204

12.Rehman S, Iqbal Z, Qureshi R, Younas M. Traditional plant-based medicines used to treat musculoskeletal disorders in district North Waziristan, Khyber Pakhtunkhwa, Pakistan. Researh Sq . 2023;1–17. https://doi.org/10.21203/rs.3.rs-3615920/v1

13.Ali A, Najibullah , Zeb A, Imranullah , Khan I. Prevalence of Inflammatory Back Pain (IBP) In Patients with Backache Visiting Rheumatology OPD at Khyber Teaching Hospital, Peshawar. Pakistan J Heal Sci. 5(06):3–7. https://doi.org/10.54393/pjhs.v5i06.1635

14.Lekhwani S, Nath B, Gupta SD, Kumari R, Vaswani ND, Pawar N. Musculoskeletal comorbidities among known diabetes patients, their quality of life, and healthcare costs: A comparative study from a tertiary care hospital in Uttarakhand. Indian Journal of Community Medicine. 2024 Jan 1;49(1):76-81.
https://doi.org/10.4103/ijcm.ijcm_832_22

15.Singh JA, Yu S. The burden of septic arthritis on the U.S. inpatient care: A national study. PLoS One. 2017;12(8):1–12.
https://doi.org/10.1371/journal.pone.0182577

16.Meraj M, Adnan F, Ali SM, Naseer M, Khalid N, Hamid M. Prevalence of osteoarthritis in Nawab Shah, Pakistan: A cross-sectional study. Rawal Med J. 2024;49(3):476–478. Available from: https://www.rmj.org.pk/fulltext/27-723502583.pdf?1727981341#page=16

17. Panigrahi A, Behera P, Mohanty SS, Sahu P, Dandsena RS, Pati S. Implementation research on osteoarthritis in Asia: a systematic review. Frontiers in Public Health. 2026 Feb 10;14:1-14. https://doi.org/10.3389/fpubh.2026.1693849

18.Qiao L, Li M, Deng F, Wen X, Deng H, Xue Z, et al. Epidemiological trends of osteoarthritis at the global, regional, and national levels from 1990 to 2021 and projections to 2050. Arthritis Res Ther. 2025;27(1):1-17.
https://doi.org/10.1186/s13075-025-03658-w

19.Virk MK, Yaqoob M, Hanif A. Prevalence of Hyperuricemia Among T2DM Patients in Pakistan: A Meta-Analysis. Journal of Health, Wellness and Community Research. 2025 Jul 15;3(8):10-16. https://doi.org/10.61919/w7af6k42

20.Ahad A, Qadir S, Khan S, Khan T, Khan S, Khalid F. Prevalence and Correlates of Hyperuricemia in Patients with Hypertension: A Cross-Sectional Study from a Tertiary Care Hospital in Pakistan. Pakistan J Heal Sci. 2025;6(2)15–19.
https://doi.org/10.54393/pjhs.v6i2.2116

21.Nagarkoti S, Subedi BK, Malla RR, Subedi S. Prevalence of hyperuricemia in patients with type 2 diabetes mellitus in tertiary care centre. Journal of General Practice and Emergency Medicine of Nepal. 2025 Jul 30;12(19):26-29.
https://doi.org/10.59284/jgpeman331

22. Ren JL, Yang J, Hu W. The global burden of osteoarthritis knee: a secondary data analysis of a population-based study. Clinical Rheumatology. 2025 Apr;44(4):1769-1810.
https://doi.org/10.1007/s10067-025-07347-6

23.Asghari KM, Zahmatyar M, Seyedi F, Motamedi A, Zolfi M, Alamdary SJ, et al. Gout: global epidemiology, risk factors, comorbidities and complications: a narrative review. BMC Musculoskelet Disord. 2024;25(1):1-19.
https://doi.org/10.1186/s12891-024-08180-9

24.Ng M, Gakidou E, Lo J, Abate YH, Abbafati C, Abbas N, et al. Global, regional, and national prevalence of adult overweight and obesity, 1990–2021, with forecasts to 2050: a forecasting study for the Global Burden of Disease Study 2021. Lancet. 2025;405(10481):813–838.
https://doi.org/10.1016/ S0140-6736(25)00355-1

25.Tiwari J, Halder P, Sharma D, Saini UC, Rajagopal V, Kiran T. Prevalence and association of musculoskeletal disorders with various risk factors among older Indian adults: Insights from a nationally representative survey. PLoS One. 2024;19(10):1–20.
http://dx.doi.org/10.1371/journal.pone.0299415

26.Haider MZ, Bhuiyan R, Ahmed S, Zahid-Al-Quadir A, Choudhury MR, Haq SA, et al. Risk factors of knee osteoarthritis in Bangladeshi adults: a national survey. BMC Musculoskelet Disord. 2022;23(1):1–9.
https://doi.org/10.1186/s12891-022-05253-5

27.Chandrashekara S, Pandya S, Shenoy P, Kumar U, Ghosh A, Dudam R, et al. Prevalence of Comorbidities Among Rheumatoid Arthritis Patients in India: A Multicentre Observational Study. Indian J Rheumatol. 2025;20(4):352–361.
https://doi.org/10.1177/09733698251349264

28.Yadav BS, Roy AN, Fatima SS. A cross-sectional study of different rheumatic diseases and their respective comorbidities at a tertiary care hospital in India. Indian Journal of Rheumatology. 2019 Mar;14(1):42-48.
https://doi.org/10.4103/injr.injr_112_18

29.World Health Organization. Integrated Care for Older People(ICOPE): guidelines for person-centred assessment and pathways in primary care [Internet]. 2nd ed. Geneva: World Health Organization; 2025 Jan 15. Available from: http://www.who.int/publications/b/71300

Key Contributions of the Authors	
Author Names	**Author Contributions**
Mirza Mabroor Ahmad	A, B,C, D
Khadija Nowaira Abdullah	B, C,D
Bibi Aliya	B,C,D
Shahab Ud Din Awan	A, B,C, D
Aqsa Qasim	A, B,C, D
Amina Khursheed	A, B,C, D

Key for Author Contributions:

A.Conception or Design
B.Acquisition, Analysis, or Interpretation of Data
C.Manuscript writing
D.Critical Review and approval

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