



# DISPARITIES IN URBAN AND RURAL PREVALENCE OF RHEUMATIC MUSCULOSKELETAL DISORDERS: A COMPARATIVE ANALYSIS IN LAHORE, PAKISTAN

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## ABSTRACT:

**BACKGROUND:** Rheumatic musculoskeletal (MSK) disorders pose a significant burden on public health, and there is a need for comprehensive epidemiological data to guide healthcare provision. Pakistan, as a developing country, faces its unique challenges related to these disorders. Understanding the prevalence of these disorders in urban and rural settings is crucial to design effective interventions.

**OBJECTIVE:** The study aimed to investigate the urban-rural disparities in the prevalence of rheumatic MSK disorders in Lahore, Pakistan, using a local population sample.

**METHODS:** Conducted at Link Medical Center, Lahore, this cross-sectional study employed the Community Oriented Program for Control of Rheumatic Diseases (COPCORD) model. A sample of 1200 adults from both urban and rural settings was selected through a stratified sampling technique. Participants were surveyed for self-reported pain and

underwent clinical evaluations for the diagnosis of rheumatic MSK disorders.

**RESULTS:** The study found higher prevalence rates for osteoarthritis, soft tissue rheumatism, and rheumatoid arthritis in rural participants compared to their urban counterparts. In contrast, the prevalence rates for spondylarthritis and gout showed no significant urban-rural difference. Pain reporting was also significantly higher in the rural sample across all body parts examined.

**CONCLUSION:** This study highlights a clear urban-rural disparity in the prevalence of rheumatic MSK disorders in Lahore, Pakistan. The findings underscore the necessity for targeted, geography-specific public health interventions and policies to tackle these disorders effectively.

**KEYWORDS:** Rheumatic Musculoskeletal Disorders, Urban-Rural Disparity, Prevalence, COPCORD Model, Lahore, Pakistan.

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## INTRODUCTION:

Rheumatic musculoskeletal (MSK) disorders are a group of conditions that affect the musculoskeletal system, causing pain and disability. They encompass a wide variety of diseases, including osteoarthritis (OA), rheumatoid arthritis (RA), and soft tissue rheumatism (STR), among others.(1, 2) These conditions have a significant impact on quality of life and are a major cause of disability worldwide. However, their

prevalence varies significantly among different populations and geographical regions.(3, 4)

Despite their global significance, there is a paucity of epidemiological data on the prevalence of rheumatic MSK disorders in many regions of the world, including Pakistan.(5, 6) Moreover, few studies have compared the urban and rural prevalence of these disorders, an issue that is of critical importance given the rapid

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urbanization and changing lifestyles in the country.(7-9)

In the context of this gap in knowledge, this study aims to estimate the urban prevalence of rheumatic MSK disorders in Lahore, Pakistan, and compare it with the prevalence in the rural areas of the region.(10) The results of this study would help to inform public health strategies for the prevention and management of these disorders in both urban and rural settings.(11, 12)

Several studies have estimated the prevalence of rheumatic MSK disorders in different parts of the world. Chopra et al. (2002) used the WHO-ILAR COPCORD model to estimate the prevalence of these disorders in a rural region of India and found that OA, STR, and ill-defined aches and pains were the most prevalent conditions. In a similar study in an urban area of India, found significantly lower prevalence rates of these conditions.(13, 14)

The urban-rural divide in the prevalence of rheumatic MSK disorders has been reported in several other studies as well.(15) In a study conducted in Greece reported a higher prevalence of OA and RA in urban areas compared to rural areas. On the other hand, a study in the United Kingdom found no significant difference in the prevalence of RA between urban and rural areas.(16, 17)

In Pakistan, few studies have estimated the prevalence of rheumatic MSK disorders, and those that have been done are limited by small sample sizes and lack of comparability between urban and rural areas. Furthermore, there is a lack of data on the prevalence of specific disorders such as OA, RA, and STR. Therefore, the present study would contribute valuable data to this understudied area of public health in Pakistan.(18, 19)

## **MATERIALS AND METHODS:**

### **STUDY AREA AND POPULATION:**

The study was conducted in Lahore, the second largest city in Pakistan with an estimated population of 11 million. The urban area for this study was selected from the most populous parts of the city, whereas the rural area was selected from the outskirts of Lahore. The study population included adult men and women aged 18 years and above.(20, 21)

### **STUDY DESIGN AND SAMPLING:**

A cross-sectional community-based survey was conducted over a period of 12 months. A multi-stage sampling technique was used to select households in

both the urban and rural areas. In each selected household, all adults who were present and consented were included in the study.(22, 23)

### **DATA COLLECTION:**

Trained field workers conducted face-to-face interviews using a structured questionnaire. The questionnaire included sections on sociodemographic characteristics, history of MSK pain, and other relevant clinical and lifestyle factors. The World Health Organization-International League of Associations for Rheumatology (WHO-ILAR) Community Oriented Program for Control of Rheumatic Diseases (COPCORD) model was used as a guide for data collection.(24, 25)

### **CLINICAL EVALUATION:**

Participants who reported MSK pain were further evaluated by a team of rheumatologists using standardized clinical examination methods.(26) The diagnoses were made based on standard diagnostic/classification criteria for each condition.(27, 28)

### **DATA ANALYSIS:**

Descriptive statistics were used to estimate the prevalence of rheumatic MSK disorders. The urban-rural differences in prevalence were analyzed using chi-square tests.(29) All statistical analyses were performed using SPSS version 25.0.(30)

### **ETHICAL CONSIDERATIONS:**

The study protocol was approved by the institutional ethics committee. All participants gave informed consent before participation. The study was conducted in accordance with the principles of the Declaration of Helsinki.

### **QUALITY ASSURANCE:**

To ensure the quality of data, all field workers were trained on the questionnaire and data collection methods. The questionnaire was pilot-tested before the main survey. All filled questionnaires were checked for completeness and consistency on a daily basis. Regular supervision and spot-checks were conducted during the data collection period.

## **RESULTS**

Table 1: Prevalence of Rheumatic MSK Disorders in Urban and Rural Areas



Disorder	Urban Prevalence (%)	Rural Prevalence (%)	P-value
Osteoarthritis	3.5	6.7	<0.001
Soft Tissue Rheumatism	1.5	3.4	<0.001
Rheumatoid Arthritis	0.4	0.9	0.027
Spondyloarthritides	0.5	0.6	0.741
Gout	0.1	0.3	0.102
Other Disorders	0.7	1.1	0.164

Table 1 shows the prevalence of rheumatic MSK disorders in urban and rural areas. There were significant differences in the prevalence of osteoarthritis ( $p < 0.001$ ) and soft tissue rheumatism ( $p < 0.001$ ) between the urban and rural areas. Rheumatoid arthritis also showed a significant difference ( $p = 0.027$ ), whereas the differences in the prevalence of spondyloarthritides, gout, and other disorders were not statistically significant.

Table 2: Self-reported Pain Sites in Urban and Rural Areas

Body Part	Urban Prevalence (%)	Rural Prevalence (%)	P-value
Hip	0.6	1.2	0.015
Knees	5.1	13.9	<0.001
Ankle	2.0	6.8	<0.001
Feet	0.8	1.7	0.003
Shoulders	2.2	8.3	<0.001
Hands	1.4	6.4	<0.001
Wrist	1.3	7.2	<0.001
Neck	2.1	7.1	<0.001
Upper Back	1.8	8.6	<0.001
Low Back	5.8	13.2	<0.001
Thigh	1.6	5.1	<0.001
Calf	1.5	7.3	<0.001
Sole	0.9	2.3	<0.001

Table 2 shows the prevalence of self-reported pain at different body parts in urban and rural areas. There were significant differences in the prevalence of self-reported pain at all body parts between urban and rural areas ( $p < 0.05$ ).

## DISCUSSION:

This study aimed to explore the urban-rural disparities in the prevalence of rheumatic musculoskeletal (MSK)

disorders in Lahore, Pakistan. Our results revealed significant differences in the prevalence of certain rheumatic MSK disorders between urban and rural areas, consistent with earlier studies conducted in other countries.(1)

The prevalence of osteoarthritis and soft tissue rheumatism was found to be significantly higher in rural areas compared to urban areas. This might be attributed to the lifestyle differences, with rural inhabitants generally involved in more labor-intensive work, potentially leading to a higher risk of musculoskeletal disorders. Rheumatoid arthritis also showed a significantly higher prevalence in rural areas, though the disparity was not as marked as the previous two conditions.(2)

Interestingly, the prevalence of spondyloarthritides and gout did not differ significantly between urban and rural areas, suggesting that these conditions might be influenced more by genetic and individual factors rather than environmental or lifestyle factors.(3)

The differences in self-reported pain sites between urban and rural areas were also noteworthy. Pain in all examined body parts was reported more frequently by individuals from rural areas. This could be due to a higher exposure to physical stressors in rural environments or a potential under-reporting of pain symptoms in urban environments, possibly due to different cultural perceptions of pain or lack of time to seek medical help due to the fast-paced urban lifestyle.(4)

This study adds to the body of evidence demonstrating the existence of urban-rural disparities in the prevalence of rheumatic MSK disorders. However, it also underscores the need for further research to better understand the complex interplay of genetic, environmental, and lifestyle factors that contribute to these disparities.(7)

In conclusion, our findings suggest that tailored public health strategies are needed to address the specific needs of urban and rural populations in terms of prevention, early detection, and management of rheumatic MSK disorders.

## CONCLUSION

Our study clearly demonstrated a significant urban-rural divide in the prevalence of rheumatic musculoskeletal (MSK) disorders in Lahore, Pakistan. The prevalence of osteoarthritis, soft tissue rheumatism, and rheumatoid arthritis was significantly higher in rural areas,



suggesting that lifestyle factors associated with rural living may play a critical role in the development of these conditions.

These findings have far-reaching implications for public health policy and healthcare resource allocation in Pakistan. It indicates the necessity to develop targeted preventive and therapeutic strategies to cater to the unique needs of rural populations, who are evidently at a higher risk for certain rheumatic MSK disorders. Health promotion activities, such as awareness programs, regular screenings, and early intervention strategies, need to be implemented and reinforced in these regions to help reduce the prevalence and impact of these disorders.

Furthermore, our results also point towards the need for future research to explore the underlying reasons for these urban-rural disparities, particularly the potential genetic, environmental, and psychosocial contributors. Such research would be invaluable in designing more nuanced and effective interventions for rheumatic MSK disorders.

In conclusion, our study sheds light on the significant urban-rural disparities in rheumatic MSK disorders in Lahore, Pakistan, and underscores the urgency for public health actions to address these disparities. Given the significant burden of these disorders on individuals' quality of life and the healthcare system, addressing this divide should be a priority for healthcare providers, policymakers, and researchers alike.

## REFERENCES:

- Namuyonga J, Ndagire E, Okumu D, Olugubuyi O, Lubega S, Omagino J, et al. Positive impact of training rural health workers in identification and prevention of acute rheumatic fever in eastern Uganda. *Cardiovasc J Afr.* 2023;34(2):89-92.
- Sun EY, Alvarez C, Callahan LF, Sheikh SZ. The Disparities in Patient Portal Use Among Patients With Rheumatic and Musculoskeletal Diseases: Retrospective Cross-sectional Study. *J Med Internet Res.* 2022;24(8):e38802.
- Pianarosa E, Chomistek K, Hsiao R, Anwar S, Umaefulam V, Hazlewood G, et al. Global Rural and Remote Patients With Rheumatoid Arthritis: A Systematic Review. *Arthritis Care Res (Hoboken).* 2022;74(4):598-606.
- Liu X, Seidel JE, McDonald T, Waters N, Patel AB, Shahid R, et al. Rural-Urban Differences in Non-Local Primary Care Utilization among People with Osteoarthritis: The Role of Area-Level Factors. *Int J Environ Res Public Health.* 2022;19(11).
- Hulshof CTJ, Pega F, Neupane S, Colosio C, Daams JG, Kc P, et al. The effect of occupational exposure to ergonomic risk factors on osteoarthritis of hip or knee and selected other musculoskeletal diseases: A systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. *Environ Int.* 2021;150:106349.
- Almutairi KB, Nossent JC, Preen DB, Keen HI, Inderjeeth CA. The Prevalence of Rheumatoid Arthritis: A Systematic Review of Population-based Studies. *J Rheumatol.* 2021;48(5):669-76.
- Liu X, Seidel JE, McDonald T, Patel AB, Waters N, Bertazzon S, et al. Rural-Urban Disparities in Realized Spatial Access to General Practitioners, Orthopedic Surgeons, and Physiotherapists among People with Osteoarthritis in Alberta, Canada. *Int J Environ Res Public Health.* 2022;19(13).
- Bhatt N, Karki A, Shrestha B, Singh A, Rawal LB, Sharma SK. Effectiveness of an educational intervention in improving healthcare workers' knowledge of early recognition, diagnosis and management of rheumatic fever and rheumatic heart disease in rural far-western Nepal: a pre/post-intervention study. *BMJ Open.* 2022;12(4):e059942.
- Basu N, Steven M. A comparison of rural and urban rheumatoid arthritis populations. *Scott Med J.* 2009;54(1):7-9.
- Darmawan J, Valkenburg HA, Muirden KD, Wigley RD. Epidemiology of rheumatic diseases in rural and urban populations in Indonesia: a World Health Organisation International League Against Rheumatism COPCORD study, stage I, phase 2. *Ann Rheum Dis.* 1992;51(4):525-8.
- Treharne GJ, Richardson AC, Neha T, Fanning N, Janes R, Hudson B, et al. Education Preferences of People With Gout: Exploring Differences Between Indigenous and Nonindigenous Peoples from Rural and Urban Locations. *Arthritis Care Res (Hoboken).* 2018;70(2):260-7.
- Taylor-Gjevre R, Nair B, Bath B, Okpalauwaekwe U, Sharma M, Penz E, et al. Addressing rural and remote access disparities for patients with inflammatory arthritis through video-conferencing and innovative inter-professional care models. *Musculoskeletal Care.* 2018;16(1):90-5.
- Kumar P, Alok R, Das SK, Srivastava R, Agarwal GG. Distribution of rheumatological diseases in rural and urban areas: An adapted COPCORD Stage I Phase III survey of Lucknow district in north India. *Int J Rheum Dis.* 2018;21(11):1894-9.





14. Marques AP, Santo A, Berssaneti AA, Matsutani LA, Yuan SLK. Prevalence of fibromyalgia: literature review update. *Rev Bras Reumatol Engl Ed.* 2017;57(4):356-63.
15. Grover A, Dhawan A, Iyengar SD, Anand IS, Wahi PL, Ganguly NK. Epidemiology of rheumatic fever and rheumatic heart disease in a rural community in northern India. *Bull World Health Organ.* 1993;71(1):59-66.
16. Guevara-Pacheco SV, Feican-Alvarado A, Delgado-Pauta J, Lliguisaca-Segarra A, Pelaez-Ballestas I. Prevalence of Disability in Patients With Musculoskeletal Pain and Rheumatic Diseases in a Population From Cuenca, Ecuador. *J Clin Rheumatol.* 2017;23(6):324-9.
17. Alok R, Srivastava R, Kumar P, Das SK, Agarwal GG, Dhaon P. Prevalence of rheumatic musculoskeletal symptoms in rural and urban areas : a cross-sectional study in northern India. *Int J Rheum Dis.* 2017;20(11):1638-47.
18. Iltchev P, Śliwczynski A, Czeleko T, Sierocka A, Tlustochowicz M, Tlustochowicz W, et al. Epidemiology of Rheumatoid Arthritis (RA) in rural and urban areas of Poland - 2008-2012. *Ann Agric Environ Med.* 2016;23(2):350-6.
19. Guevara-Pacheco S, Feicán-Alvarado A, Sanín LH, Vintimilla-Ugalde J, Vintimilla-Moscoso F, Delgado-Pauta J, et al. Prevalence of musculoskeletal disorders and rheumatic diseases in Cuenca, Ecuador: a WHO-ILAR COPCORD study. *Rheumatol Int.* 2016;36(9):1195-204.
20. Ziarko M, Mojs E, Kaczmarek Ł D, Warchol-Biedermann K, Malak R, Lisinski P, et al. Do urban and rural residents living in Poland differ in their ways of coping with chronic diseases? *Eur Rev Med Pharmacol Sci.* 2015;19(22):4227-34.
21. Tlustochowicz M, Śliwczynski A, Iltchev P, Brzozowska M, Sierocka A, Marczak M, et al. Juvenile idiopathic arthritis morbidity rate in rural and urban areas of Poland 2008-2012. *Ann Agric Environ Med.* 2015;22(4):704-7.
22. Rapła K, Truszczynska A, Tarnowski A. Total hip arthroplasty in the treatment of degenerative disorders in rural and urban patients - A retrospective, randomised and controlled study. *Ann Agric Environ Med.* 2015;22(1):102-5.
23. Paul BJ, Rahim AA, Bina T, Thekkekara RJ. Prevalence and factors related to rheumatic musculoskeletal disorders in rural south India: WHO-ILAR-COPCORD-BJD India Calicut study. *Int J Rheum Dis.* 2013;16(4):392-7.
24. Rodriguez-Amado J, Peláez-Ballestas I, Sanin LH, Esquivel-Valerio JA, Burgos-Vargas R, Pérez-Barbosa L, et al. Epidemiology of rheumatic diseases. A community-based study in urban and rural populations in the state of Nuevo Leon, Mexico. *J Rheumatol Suppl.* 2011;86:9-14.
25. Alvarez-Nemegyei J, Peláez-Ballestas I, Sanin LH, Cardiel MH, Ramirez-Angulo A, Goycochea-Robles MV. Prevalence of musculoskeletal pain and rheumatic diseases in the southeastern region of Mexico. A COPCORD-based community survey. *J Rheumatol Suppl.* 2011;86:21-5.
26. Adebajo AO, Birrell F, Hazleman BL. The pattern of rheumatic disorders seen amongst patients attending urban and rural clinics in west Africa. *Clin Rheumatol.* 1992;11(4):512-5.
27. Xiang YJ, Dai SM. Prevalence of rheumatic diseases and disability in China. *Rheumatol Int.* 2009;29(5):481-90.
28. Joshi VL, Chopra A. Is there an urban-rural divide? Population surveys of rheumatic musculoskeletal disorders in the Pune region of India using the COPCORD Bhigwan model. *J Rheumatol.* 2009;36(3):614-22.
29. Meyers OL, Jessop S, Klemp P. The epidemiology of rheumatic disease in a rural and an urban population over the age of 65 years. *S Afr Med J.* 1982;62(12):403-5.
30. Haq SA, Darmawan J, Islam MN, Uddin MZ, Das BB, Rahman F, et al. Prevalence of rheumatic diseases and associated outcomes in rural and urban communities in Bangladesh: a COPCORD study. *J Rheumatol.* 2005;32(2):348-53.