

Musculoskeletal Comorbidities and Physical Activity Patterns in Adults Aged 50 Years and Above with Acute Low Back Pain in Rural Goa

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Abstract:

Introduction: Low back pain (LBP) is a leading cause of disability worldwide and particularly burdensome among older adults, who often have multiple musculoskeletal complaints and low physical activity levels. **Objectives:** To describe the demographic profile, musculoskeletal comorbidities, body mass index (BMI) and physical activity patterns among adults aged 50 years and above with acute LBP attending Rural Health & Training Centre (RHTC) in Goa, and to explore differences by gender and age group. **Methods:** A hospital-based cross-sectional descriptive study was conducted among 150 consecutively recruited participants using convenience sampling attending an acute low back pain screening camp at RHTC Mandur, Goa. Sociodemographic data, BMI, comorbid musculoskeletal pain and physical activity were recorded using a structured proforma & standard scales. Descriptive statistics (means with standard deviations, frequencies and percentages) and gender and age-stratified distributions were generated. **Results:** The mean age was 64.3 years (SD 9.15; range 51–87), and 55.3% were female; 58.7% were older than 60 years. Comorbid musculoskeletal complaints were frequent: knee pain (24.7%), hip pain (19.3%), shoulder pain (17.3%), ankle pain (13.3%) and generalised body pain (12.7%). Joint-specific pains commonly coexisted with LBP, with modest variation by gender. **Conclusion:** Among adults aged ≥50 years attending a rural screening camp with acute LBP, females and those over 60 years predominated, with high levels of multi-site musculoskeletal pain and suboptimal physical activity. These findings highlight the need for early identification and comprehensive management of musculoskeletal complaints, alongside counselling on appropriate activity levels, to reduce LBP-related functional limitations in rural clinic populations.

Keywords: Exercise, Low back pain, Musculoskeletal Diseases, Rural Health

Introduction:

Low back pain (LBP) is a leading cause of disability worldwide and affects individuals across all age groups. Musculoskeletal conditions, including LBP, contribute substantially to years lived with disability and impose a

considerable economic burden on individuals, families, health systems and society.^[1]

Epidemiological studies have consistently highlighted gender differences in the prevalence and impact of LBP, with women frequently reporting higher prevalence and

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greater disability compared to men. Comorbidities and psychosocial factors are also often more common among women with LBP, which may further influence symptom severity and care-seeking behaviour.^[2]

Although low back pain (LBP) has been extensively studied worldwide, most available evidence originates from high-income countries or urban populations. Recent global estimates indicate that LBP remains the leading cause of years lived with disability, with its burden expected to increase substantially due to population ageing and demographic changes.^[3] In India, systematic reviews have demonstrated a considerable prevalence of LBP across different population groups; however, most studies have focused on occupational risk factors or the overall prevalence of LBP rather than the coexistence of musculoskeletal comorbidities among older adults. Furthermore, evidence describing physical activity patterns and associated musculoskeletal conditions in rural primary healthcare settings is limited.^[4]

Several factors have been hypothesised to influence the occurrence and severity of LBP, including age, gender, BMI, occupational exposures and physical activity patterns. Very low levels of activity and prolonged sedentary behaviour can contribute to deconditioning, poor posture and stiffness, whereas high levels of heavy or repetitive physical work can also provoke or exacerbate back pain. Musculoskeletal comorbidities affecting the knee, hip, ankle and shoulder joints may coexist with LBP, reflecting shared biomechanical loads or degenerative processes, and may compound functional limitations.^[5]

Understanding the profile of older adults with acute LBP who seek care in rural health facilities is important for planning targeted preventive and rehabilitative strategies. In particular, documenting coexisting joint pains and physical activity patterns can inform comprehensive management approaches that go beyond isolated treatment of the lumbar spine.

Despite the high burden of low back pain among older adults, there is limited evidence from rural primary care settings in India—particularly from Goa—describing the coexistence of musculoskeletal

comorbidities, body mass index, and physical activity patterns among adults aged 50 years and above presenting with acute low back pain. This study was therefore undertaken to address this important knowledge gap and provide evidence to support comprehensive musculoskeletal care in rural health settings.

Materials and Methods

Study setting and design

This was a cross-sectional descriptive study conducted at the Rural Health & Training Centre (RHTC), Mandur, Goa. Data was collected during an acute LBP screening camp organised at the centre.

Study population and Eligibility criteria

The study population comprised adults aged **50 years and above** who attended the acute low back pain (LBP) screening camp conducted at the Rural Health & Training Centre (RHTC), Mandur, Goa, and were clinically diagnosed with acute LBP. Acute LBP was defined as pain localized between the lower rib margin and the gluteal folds, with or without leg pain, of **up to six weeks' duration**. Participants who provided written informed consent were included in the study. Individuals with chronic LBP (pain lasting more than three months) or specific spinal pathologies such as malignancy, spinal infection, or recent spinal trauma, as well as those who declined to provide informed consent, were excluded.

Sample size and Sampling technique

Since this was a camp-based cross-sectional descriptive study, a formal sample size calculation was not performed. All consecutive eligible adults aged 50 years and above with acute low back pain who attended the screening camp during the study period and fulfilled the eligibility criteria were invited to participate. A total of 150 participants were enrolled using consecutive (total enumerative) sampling.

Data collection tools and variables

Data was collected using a structured case record form and two standardised questionnaires: the International Physical Activity Questionnaire (IPAQ)^[6] and the Musculoskeletal Health Questionnaire (MSK-HQ)^[7]. Sociodemographic details (age, gender),

anthropometric measurements (weight, height for BMI calculation)^[8] and clinical information on LBP and other joint pains (knee, hip, ankle, shoulder, generalised body pain) were recorded.

According to WHO standard cutoffs, BMI was classified as underweight (<18.5), normal (18.5–24.9), overweight (25–29.9), and obese (≥30). The IPAQ was used to classify physical activity into vigorous, moderate, mild and no activity (sedentary) based on self-reported duration and intensity of activities in a typical week. The MSK-HQ was used to capture musculoskeletal symptoms and their impact on function; for the present analysis we report primarily the presence of joint-specific pain and generalised body pain.

Statistical analysis

All data were coded and analysed using IBM SPSS Statistics version 22. Continuous variables such as age were summarised as mean and standard deviation (SD), and categorical variables such as gender, BMI category, joint-specific pain and physical activity categories were

summarised as frequencies and percentages. To explore differences by gender and age group, the chi-square test as appropriate, was used for categorical variables, and the independent-samples t-test was used for comparison of mean age between groups. A p-value of less than 0.05 was considered statistically significant.

Ethical considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee. All participants provided written informed consent prior to enrolment. The study adhered to the principles of the Declaration of Helsinki.

Results

Table 1 shows the characteristics of the 150 adults aged 50 years and above presenting with acute low back pain (LBP). The mean age of the study participants was 64.3 years (SD 9.15), with a median of 63.0 years and an age range of 51–87 years, and nearly three-fifths of participants were older than 60 years (58.7%). Females constituted a slight majority (55.3%), and more than half

Table 1: Distribution of study participants according to sociodemographic and clinical characteristics (N = 150).

Characteristic	Category	n	%
Age (years)	Mean ± SD	64.3 ± 9.15	–
	Median (IQR)	63.0	–
	Range	51–87	–
Age group	50–60 years	62	41.3
	>60 years	88	58.7
Gender	Female	83	55.3
	Male	67	44.7
Body mass index (BMI)	Underweight	35	23.3
	Normal	85	56.7
	Overweight	18	12.0
	Obese	12	8.0
Low back pain comorbidities	LBP only	33	22.0
	Generalised body pain	19	12.7
	Knee pain + LBP	17	11.3
	Shoulder pain + LBP	16	10.7
	Hip pain + LBP	12	8.0
	Rheumatoid arthritis + LBP	9	6.0
	Other combinations	63	42.0

Abbreviations: BMI = Body Mass Index; IQR = Interquartile Range; LBP = Low Back Pain; SD = Standard Deviation.

Table 2: Association between gender and musculoskeletal pain among study participants (N = 150).

Pain site	Female, n (%)	Male, n (%)	Total, n (%)	χ^2	p-value
Ankle pain	10 (12.0)	10 (14.9)	20 (13.3)	0.27	0.606
Hip pain	17 (20.5)	12 (17.9)	29 (19.3)	0.16	0.692
Shoulder pain	12 (14.5)	14 (20.9)	26 (17.3)	1.07	0.300
Generalised body pain	10 (12.0)	9 (13.4)	19 (12.7)	0.06	0.800
Knee pain	15 (18.1)	22 (32.8)	37 (24.7)	4.35	0.037*
Total participants	83 (55.3)	67 (44.7)	150 (100.0)	—	—

Abbreviation: χ^2 = Chi-square test.

Statistically significant at $p < 0.05$.

Table 3: Association between gender and physical activity level among study participants (N = 150).

Physical activity level	Female, n (%)	Male, n (%)	Total, n (%)	χ^2	p-value
Vigorous	19 (22.9)	11 (16.4)	30 (20.0)		
Moderate	14 (16.9)	15 (22.4)	29 (19.3)		
Mild	50 (60.2)	41 (61.2)	91 (60.7)		
Total	83 (100.0)	67 (100.0)	150 (100.0)	0.95	0.622

χ^2 = Chi-square test.

of the sample had a normal BMI (56.7%), while 23.3% were underweight and 20.0% were either overweight or obese.

Table 1 also summarises the distribution of LBP comorbidities, indicating a substantial burden of multi-site musculoskeletal pain. Only 22.0% of participants reported LBP alone, whereas the remainder had additional complaints such as generalised body pain (12.7%), knee pain with LBP (11.3%), shoulder pain with LBP (10.7%), hip pain with LBP (8.0%) and rheumatoid arthritis with LBP (6.0%), with other combinations accounting for a further 42.0% of cases.

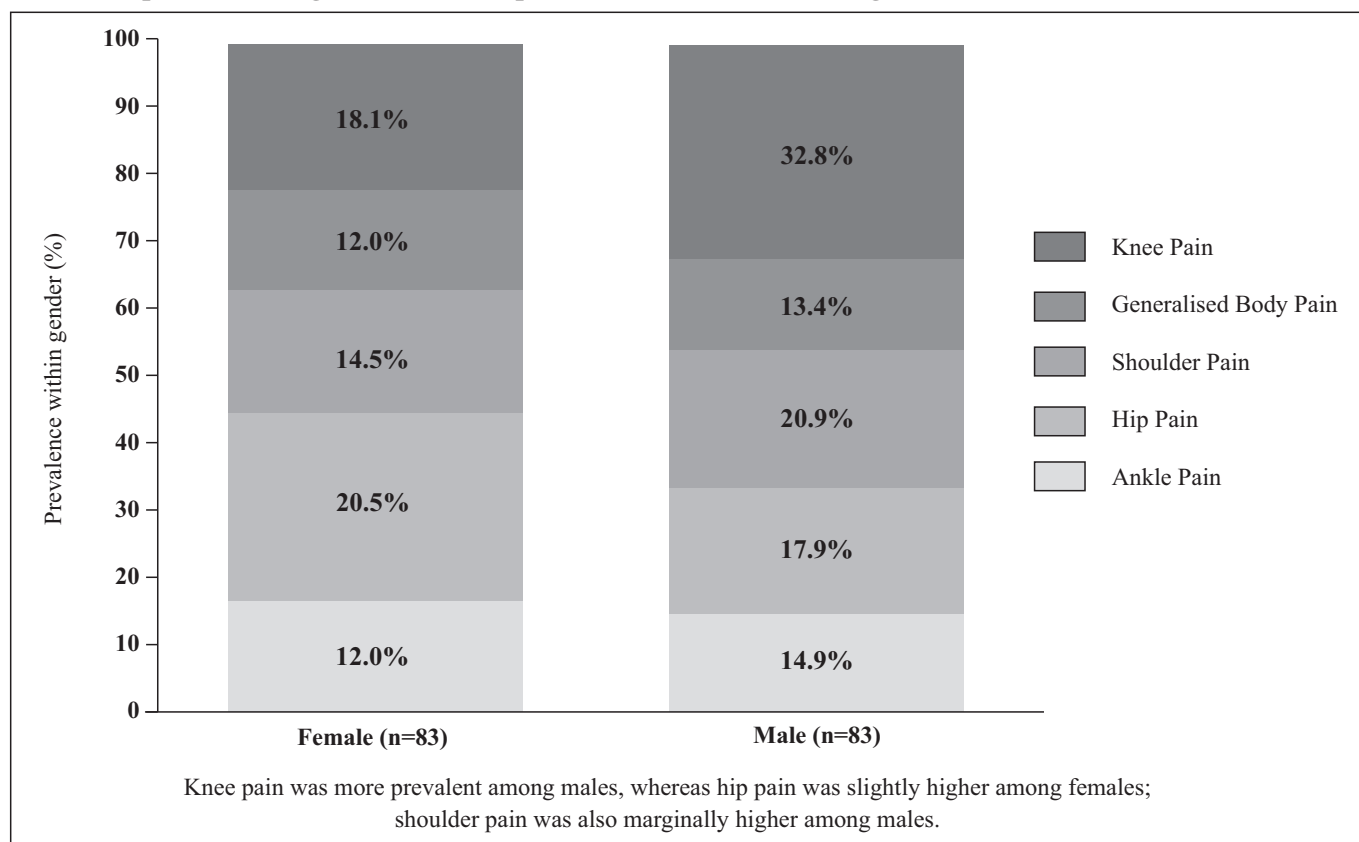
Table 2 presents musculoskeletal pain by gender. Ankle pain was reported by 13.3% of participants, with no significant difference between females and males ($p=0.606$). Hip pain was present in 19.3% of participants and was also not significantly different by gender ($p=0.692$). Shoulder pain showed no significant gender difference ($p=0.300$), and generalised body pain was

similarly distributed between females and males ($p = 0.800$). Knee pain was the most frequent joint-specific complaint and was significantly more common in males than females (32.8% vs 18.1%; $p=0.037$).

Table 3 shows that most participants were **mildly active** (91/150, 60.7%), followed by vigorous activity (30/150, 20.0%) and moderate activity (29/150, 19.3%). Among females, 60.2% were mildly active, 22.9% reported vigorous activity, and 16.9% reported moderate activity; the corresponding proportions among males were 61.2%, 16.4%, and 22.4%, respectively.

Figure 1 shows the gender stratified prevalence of ankle, hip, shoulder, generalised body and knee pain, expressed as percentages within each gender. Among females, hip pain and knee pain are the most frequent complaints (around one-fifth of women), whereas among males, knee pain is clearly dominant, affecting nearly one-third of men, followed by shoulder and hip pain at lower but still substantial levels.

Figure 1.: Gender-wise distribution of musculoskeletal pain among adults aged ≥ 50 years with acute low back pain attending the health camp at Rural Health & Training Centre, Goa



Discussion

The present study demonstrated that acute low back pain predominantly affected older adults, with nearly three-fifths of participants aged above 60 years. Similar findings have been reported by **Shetty et al.**, whose systematic review and meta-analysis demonstrated that the prevalence of low back pain increases progressively with advancing age because of degenerative spinal changes and cumulative biomechanical stress.^[9] Likewise, **Tiwari et al.**, using nationally representative LASI data, reported significantly higher prevalence of musculoskeletal disorders among adults aged 60 years and above, supporting the age distribution observed in the present study.^[10] A slight female predominance was observed in the present study, which is consistent with the findings of **Shetty et al.**, who reported higher prevalence of low back pain among women across Indian studies.^[9] Similarly, **Sharma et al.** demonstrated that older Indian women had significantly higher odds of experiencing back pain and multisite musculoskeletal

pain than men, highlighting the influence of biological and social factors on musculoskeletal health.^[9]

An important observation of the present study was the high burden of multisite musculoskeletal pain, with only 22% of participants presenting with isolated low back pain. Similar findings were reported by **Muthunarayanan et al.**, who observed that low back pain among elderly individuals in rural Tamil Nadu commonly coexisted with knee pain, hip pain, and other musculoskeletal disorders.^[11] Likewise, **Tiwari et al.** reported that musculoskeletal disorders among older Indian adults frequently occur concurrently rather than in isolation. These findings suggest that elderly patients presenting with acute low back pain should undergo comprehensive musculoskeletal evaluation rather than assessment focused solely on the lumbar spine, thereby facilitating early diagnosis of associated joint disorders and improving overall functional outcomes.^[10]

Knee pain was the most frequent musculoskeletal comorbidity among older adults with acute low back

pain, whereas ankle pain, hip pain, shoulder pain, and generalized body pain showed no significant gender differences. Similar findings were reported by **Mohanty et al.**, who observed that lower-limb musculoskeletal pain among older adults in India was predominantly knee pain, while hip pain was comparatively less frequent. They also reported that the burden of pain increased with advancing age, indicating that degenerative musculoskeletal disorders are primarily age-related.^[12] Similar findings were reported by Chard et al., who observed that shoulder disorders were common among community-dwelling older adults. Although women had a somewhat higher prevalence than men, shoulder pain represented an important musculoskeletal complaint in both genders.^[13] Comparable findings were reported from the Longitudinal Ageing Study in India, where ankle/foot pain constituted a smaller proportion of musculoskeletal complaints than joint pain among middle-aged and older adults.^[14]

In the present study, knee pain was significantly more common among males than females. This finding contrasts with the study by **Sengupta et al.**, who reported that knee pain was the most common musculoskeletal complaint among older adults in rural West Bengal and was more frequently observed among women. The higher prevalence among males in the present study may be attributed to greater occupational exposure to physically demanding activities such as farming, prolonged standing, squatting, and manual labour.^[15] Furthermore, reports from the **National Programme for Health Care of the Elderly** have consistently identified knee osteoarthritis as one of the leading musculoskeletal conditions among older Indians, emphasizing that knee pain commonly coexists with low back pain and should be routinely assessed during clinical evaluation.^[16]

In the study majority of older adults with acute low back pain were mildly physically active, whereas fewer participants engaged in moderate or vigorous physical activity. Similar findings were reported by **Gupta et al.**, who observed that light-to-moderate activity predominated among older adults in Delhi, with advancing age and musculoskeletal pain limiting

participation in higher-intensity activities.^[17] Likewise, the **ICMR-INDIAB study** conducted by **Anjana et al.** demonstrated that physical inactivity is highly prevalent among Indian adults, with only a small proportion participating in vigorous physical activity.^[18] Similar findings have been reported by **Stubbs et al.**, who demonstrated that older adults with chronic musculoskeletal pain, particularly chronic low back pain, were significantly less physically active than those without pain. Chronic pain was associated with reduced participation in moderate and vigorous physical activities, which may explain the predominance of mild physical activity observed in the present study.^[19]

No significant gender differences in overall physical activity were observed in the present study. A similar pattern was reported by Lee, who found that although older women participated more in household activities and men engaged more in leisure-time physical activity, differences in overall activity reflected the type of activity performed rather than marked disparities in total physical activity.^[20] Furthermore, **Stubbs et al.** reported that pain-related fear of movement and functional limitations often reduce participation in moderate and vigorous exercise among individuals with low back pain, resulting in reliance on light daily activities.^[19] In view of the **World Health Organization** recommendations for regular moderate-to-vigorous physical activity among older adults, the present findings highlight the importance of incorporating structured exercise and physiotherapy into the management of acute low back pain to improve functional capacity and reduce future disability.^[20]

Acute low back pain in this rural Goa clinic sample is largely a problem of older adults, with the majority clustered between 60 and 70 years and relatively few participants at the youngest and oldest ends of the spectrum. This finding is consistent with the systematic review by **de Souza et al.**, which reported that low back pain is highly prevalent among adults aged 60 years and above and is frequently associated with functional disability and reduced independence.^[21] Similarly, the systematic review and meta-analysis by **Shetty et al.** demonstrated that the burden of low back pain in India

increases with advancing age, with the highest prevalence observed among older adults, particularly women and rural populations. The authors attributed this pattern to age-related degenerative spinal changes, cumulative occupational exposure, and declining musculoskeletal function.^[9]

Furthermore, **Bayartai et al.** showed that frailty is closely associated with greater low back pain intensity and disability among community-dwelling older adults, highlighting the need to incorporate frailty assessment into routine clinical evaluation.^[22] Similarly, **Wong et al.** emphasized that older adults with low back pain often experience age-related functional decline, sarcopenia, and reduced mobility, necessitating a comprehensive geriatric approach rather than symptom-focused management alone.^[23]

Multisite musculoskeletal pain was common among older adults with acute low back pain, with knee pain being the most frequent associated complaint. Similar findings were reported by **Goyal and Mohanty**, who analysed data from the Longitudinal Ageing Study in India (LASI) and found that joint pain, back pain, and lower-limb pain commonly coexisted among middle-aged and older adults. Although their study reported a higher prevalence of multisite pain among females, the present study observed significantly higher knee pain among males, possibly reflecting differences in the study population and occupational characteristics. These findings highlight the importance of comprehensive musculoskeletal assessment in older adults with low back pain.^[14]

Limitations

This study has some limitations. First, its cross-sectional design captures information at a single point in time and does not allow conclusions about causality or the temporal sequence between LBP and musculoskeletal comorbidities. Second, the use of convenience sampling at a single Rural Health & Training Centre limits the generalisability of the findings to other settings, including urban populations or other regions.

Third, data on physical activity and pain symptoms were self-reported using the IPAQ and MSK-HQ, and are therefore subject to recall and reporting biases. Objective measures of activity (e.g., accelerometry) and clinical assessments of joint pathology were not available. Fourth, the sample size, although adequate for a descriptive exploration, may not be sufficient to detect small differences between subgroups.

Fifth, several potentially important confounding factors such as occupation type, psychosocial stress, duration and severity of pain, and medication use were not fully captured and could not be examined in detail. Finally, the focus on acute LBP means that chronic and recurrent pain patterns were not addressed, and longitudinal outcomes could not be assessed.

Conclusion

In this cross-sectional descriptive study of adults aged 50 years and above attending a Rural Health & Training Centre in Goa with acute LBP, females and individuals older than 60 years formed the majority of clinic attendees. Comorbid musculoskeletal complaints, particularly involving the knee, hip, ankle and shoulder, were common, and a substantial proportion of participants had either low or no reported physical activity.

These findings highlight the importance of early identification and comprehensive management of musculoskeletal health in older adults with acute LBP in rural settings. Integrating assessment of multi-site pain, BMI and physical activity patterns into routine care, along with patient education on appropriate activity and ergonomics, may help reduce functional limitations and the longer-term burden associated with LBP.

Recommendations

Based on the high proportion of older adults with acute low back pain who also reported musculoskeletal complaints involving the knee, hip, ankle and shoulder, routine clinical assessment at Rural Health & Training Centres should include screening for pain at these commonly affected sites. Early identification of coexisting musculoskeletal complaints may facilitate comprehensive management and appropriate referral for physiotherapy or specialist care when indicated.

As a considerable proportion of participants reported low or no physical activity, routine assessment of physical activity status should be incorporated into the clinical evaluation of older adults presenting with acute low back pain. Individualised counselling on maintaining regular, moderate physical activity appropriate for age and functional status may help improve musculoskeletal health and reduce functional limitations.

Further longitudinal and community-based studies involving larger and more representative rural populations are recommended to better understand the temporal relationship between physical activity, body mass index, coexisting musculoskeletal complaints and acute low back pain, and to evaluate interventions aimed at improving musculoskeletal health in older adults.

Declaration

Conflict of Interest

The authors declare that there is no conflict of interest related to this study.

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Use of AI

All data analysis, interpretation of results and final approval of the content were performed by the authors, who take full responsibility for the integrity and accuracy of the work.writing.

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