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PREVALENCE OF ROTATOR CUFF INJURY IN RECREATIONAL BOWLERS

An observational study

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Abstract -

Background: Cricket bowling involves repetitive overhead movements that place considerable stress on the shoulder joint, particularly the rotator cuff muscles. Repetitive bowling actions may contribute to shoulder pain and functional limitations among recreational bowlers. Identifying shoulder-related symptoms is important for early intervention and prevention of further dysfunction.

Design: A cross-sectional observational study was conducted among recreational cricket bowlers.

Method: A total of 190 recreational cricket bowlers aged 20–40 years were included using convenient sampling. Demographic details, including age, sex, hand dominance and cricket-playing experience, were recorded. Shoulder pain and functional disability were assessed using the Shoulder Pain and Disability Index (SPADI) questionnaire. The collected data were analysed using appropriate descriptive and non-parametric statistical methods.

Results: Out of 190 participants, 153 reported shoulder pain symptoms, indicating a prevalence of 80.53%, while 37 participants (19.47%) reported no shoulder pain. The mean SPADI pain score was 44.85%, and the mean disability score was 44.96%. No statistically significant differences were observed in SPADI scores according to sex or hand dominance. Age showed a weak positive association with shoulder pain and overall SPADI scores, whereas cricket-playing experience showed no significant association with SPADI scores.

Conclusion: The study found a high prevalence of self-reported shoulder pain symptoms among recreational cricket bowlers. These findings highlight the importance of early identification, appropriate shoulder conditioning and preventive physiotherapy interventions. However, SPADI assesses shoulder pain and disability and does not independently confirm structural rotator cuff injuries. Further clinical assessment is required to establish the presence of rotator cuff pathology.

IndexTerms - Recreational cricket bowlers, Rotator cuff, Shoulder pain, Shoulder Pain and Disability Index (SPADI), Shoulder disability, Prevalence.

INTRODUCTION

Cricket is a sport that requires a complex combination of strength, endurance, coordination, and biomechanical precision. Among the various roles in cricket, bowling is particularly demanding on the musculoskeletal system, especially on the shoulder joint. The bowling action is a high-velocity, repetitive overhead movement that involves coordinated activation of the lower limb, trunk, and upper limb to generate force and deliver the ball effectively. During this kinetic chain sequence, the shoulder joint acts as a crucial link for force transmission. Because of its wide range of motion and relatively low inherent stability, the shoulder is highly susceptible to overuse injuries, particularly those affecting the rotator cuff [(1,2)].

The rotator cuff muscles, including the supraspinatus, infraspinatus, teres minor, and subscapularis, are essential dynamic stabilizers of the glenohumeral joint. They maintain the humeral head within the glenoid cavity during rapid and forceful movements. In bowling, especially fast bowling, the shoulder undergoes extreme external rotation followed by explosive internal rotation and rapid deceleration. This high angular velocity creates substantial tensile and compressive forces on the rotator cuff tendons. Repetitive exposure to such forces without adequate rest and conditioning can lead to microtears, tendinopathy, inflammation, impingement, and eventual structural damage [(6,9)].

Studies have shown that repetitive overhead activities lead to adaptive changes in shoulder mobility and stability. An observational study conducted among recreational bowlers in Belagavi City identified the prevalence of glenohumeral internal rotation deficit (GIRD), a condition commonly observed in overhead athletes [(2)]. GIRD may reflect posterior shoulder tightness and altered humeral head mechanics. These changes can affect shoulder movement and potentially increase the risk of rotator cuff-related problems during repetitive overhead activities [(2,11)].

Shoulder instability is another important factor associated with shoulder dysfunction in bowlers. Research conducted among recreational bowlers and young amateur fast bowlers has investigated the prevalence of shoulder instability in these populations [(1,3)].

Instability may increase the demand on the rotator cuff muscles for dynamic stabilization, potentially contributing to muscle fatigue and overuse. Repeated microtrauma, particularly in the presence of altered shoulder mechanics, may further contribute to rotator cuff dysfunction [(1,3)].

Long-term surveillance studies in cricketers further highlight the burden of shoulder injuries. An eight-season analysis of elite female cricket players reported shoulder injuries among the musculoskeletal conditions affecting participation and performance [4].

Additionally, a prospective cohort study among elite South African cricketers documented both time-loss and non-time-loss shoulder injuries during a single season [5].

The occurrence of non-time-loss injuries suggests that some players continue participating despite shoulder symptoms, which may affect their performance and delay appropriate management [4,5].

Previous research in professional cricketers has also examined the occurrence and characteristics of shoulder injuries associated with cricket participation [6].

A prospective observational study investigating upper-limb injuries in professional cricket players further highlighted the importance of monitoring upper-limb injury patterns in this population [7].

These findings emphasize the need to understand shoulder-related problems not only among professional players but also among recreational bowlers, who may have different training practices, conditioning levels, and access to sports medicine services [6,7].

Functional conditions such as shoulder impingement syndrome have also been investigated among cricketers. A study conducted in Puducherry examined the prevalence of shoulder impingement syndrome among cricketers, highlighting the importance of assessing shoulder-related symptoms in this sporting population [8].

Shoulder impingement-related symptoms may coexist with rotator cuff dysfunction and can affect overhead activities. Furthermore, research examining collegiate cricket bowlers using an isokinetic dynamometer identified rotator muscle strength imbalance at different angular velocities, emphasizing the importance of balanced rotator cuff muscle function in shoulder performance [9].

Although previous studies have investigated shoulder instability, glenohumeral internal rotation deficit, shoulder impingement, and rotator muscle imbalance among cricketers, these conditions are distinct from a confirmed rotator cuff injury. Therefore, assessing shoulder pain and disability among recreational bowlers may help identify the burden of shoulder-related symptoms in this population. The Shoulder Pain and Disability Index (SPADI) is a patient-reported outcome measure used to assess shoulder pain and disability [10]. Its application in this study may provide useful information regarding shoulder-related symptoms and functional limitations among recreational bowlers. However, SPADI scores alone cannot confirm a structural rotator cuff injury; clinical assessment would be required for diagnostic confirmation.

NEED OF STUDY

There is a lack of community-based data regarding the prevalence of these injuries in recreational bowlers. Recreational bowler have a risk of injury compared to professionals due to poor technique, inadequate warm-up protocols, muscle imbalances, and a general lack of structured physical conditioning.

AIM

To determine the prevalence of rotator cuff injury in recreational bowlers.

OBJECTIVE

To assess the prevalence of rotator cuff injury in recreational bowlers by using spadi scale

Review of Literature

- Motimath et al. (2025) conducted an observational study to determine the prevalence of Glenohumeral Internal Rotation Deficit (GIRD) among recreational cricket bowlers in Belagavi city. The study included 93 bowlers aged 18–25 years. Goniometric assessment was used to compare internal rotation of dominant and non-dominant shoulders. The study reported a 37% prevalence of GIRD, with significant positive correlation between GIRD and age ($r = 0.369$, $p = 0.001$) and years of experience ($r = 0.263$, $p = 0.011$). However, no significant association was found with weekly practice frequency. The authors emphasized the importance of early screening and preventive strategies. [2]
- Patil et al. (2023) conducted an observational study on 120 young amateur fast bowlers aged 16–25 years to determine the prevalence of shoulder instability. Clinical tests including anterior and posterior apprehension tests were used. The study reported a prevalence of 44.6% shoulder instability among participants. The authors concluded that repetitive bowling actions and improper technique significantly contribute to instability and emphasized preventive strengthening programs. [3]
- Pritchard et al. (2025) conducted a comprehensive epidemiological study examining shoulder injuries in elite female Australian cricketers across eight competitive seasons. Analysis of injury surveillance data from Cricket Australia's medical system revealed 409 shoulder injuries recorded from 2015 to 2023, equating to an average incidence of approximately 12.9 shoulder injuries per 100 players per season. The study highlighted that gradual (overuse) onset injuries were more frequent than acute injuries, particularly affecting players with repetitive dominant arm loading such as pace bowlers. Although only about 20% of these injuries resulted in full time-loss, a substantial proportion required activity modification (e.g., reduced bowling or throwing) for periods ranging from 2 weeks to 6 months, indicating a broader functional burden not fully captured by time-loss metrics alone. Players typically returned to unrestricted play within 1 to 8.5 months, with recurrent injuries generally associated with longer recovery durations. [4]
- Stretch RA et al. (2019) conducted a study on elite South African cricketers and reported a significant incidence of shoulder injuries, including both time-loss and non-time-loss injuries. The study highlighted that repetitive overhead bowling action places continuous stress on the rotator cuff muscles, increasing injury risk and affecting player performance. [5]
- Ranson C et al. (2008) examined shoulder injuries in professional cricketers and found that fast bowlers were more prone to rotator cuff-related pathologies due to repetitive overhead activity. The study emphasized biomechanical stress and workload as major contributing factors. [5]

MATERIALS AND METHODOLOGY

Methodology

- Study Design: Cross-sectional Study
- Study Type: An Observational Study.
- Sampling Method: Convenient Sampling
- Study Subject: Recreational bowlers (male and female)
- Duration: 6-8 months
- Population: Recreational bowlers aged 20-40 years
- Sample Size: 190 samples

Materials

- Consent form
- Demographic and occupational data sheet
- SPADI (Shoulder Pain And Disability Index)
- Pen and paper

Inclusion Criteria

- Cricket bowlers aged 20 - 40 years.
- Individuals playing cricket for at least 3 months.
- Players who participate in cricket at least twice per week.

Exclusion Criteria

- Players with history of shoulder surgery or severe traumatic fractures.
- Players currently undergoing rehabilitation for other major musculoskeletal injuries.

Outcome Measure

Functional outcome using validated tools (e.g., Shoulder pain and disability index (SPADI) (https://doi.org/10.1016/S1836-9553(11)70045-5)

- Reliability coefficient >0.89 in variety of patient population
- Cronbach typically exceeding 0.90. Validity of the SPADI demonstrates good construct validity

Reference:

Breckenridge JD, McAuley JH. Shoulder Pain and Disability Index (SPADI). *J Physiother*. 2011;57(3):197.;57(3):197-197.

Procedure

- Study will be submitted to the Jayantrao tilak Maharashtra Vidyapeeth collage of health professions, scientific committee and ethical committee of Tilak Maharashtra Vidyapeeth College of Physiotherapy, Pune
- Permission will be taken from the coach and cricket academy, and players
- Procedure of the study will be explained to all participants
- Basic demographic and cricket-related information will be recorded
- Each participant will be provided with the SPADI questionnaire to assess shoulder pain and functional disability
- Participants will be instructed to rate each item on a scale from 0 to 10
- Pain and disability scores will be calculated separately
- The number of symptomatic participants will be identified and recorded
- Prevalence will be calculated of symptomatic players by the total number of participants and expressing the result as a percentage

DATA ANALYSIS AND INTERPRETATION

Data were analyzed using appropriate statistical methods. A total of 190 recreational cricket bowlers were included in the analysis, with complete data available for all eight study variables. No missing values were identified, and therefore, no imputation was required.

- Continuous variables were summarized using mean, standard deviation (SD), median, interquartile range (IQR) and range. Categorical variables were presented as frequencies and percentages.
- Normality of continuous variables was assessed using the Shapiro–Wilk test. Statistically significant departures from normality were observed for age, cricket-playing experience and all three SPADI scores ($p < .001$).
- The primary outcome was the prevalence of self-reported shoulder pain symptoms, defined as a nonzero SPADI pain score. Prevalence was calculated as the proportion of participants reporting shoulder pain, along with a 95% confidence interval.
- SPADI pain, disability and total scores were analyzed descriptively to understand the distribution and severity of shoulder-related symptoms and functional limitations.
- Differences in SPADI scores according to sex and hand dominance were assessed using the Mann–Whitney U test.
- Associations between age, cricket-playing experience and SPADI scores were examined using Spearman's rank-order correlation.
- Associations between the presence of shoulder pain symptoms and sex or hand dominance were assessed using Fisher's exact test.
- Holm adjustment was applied for multiple comparisons to reduce the possibility of false-positive findings.
- The analysis demonstrated a high prevalence of self-reported shoulder pain symptoms among recreational cricket bowlers, while significant associations were observed between age and SPADI pain and total scores.

Table 1. Sex Distribution

Sex	n	%
Male	178	93.68
Female	12	6.32
Total	190	100.00

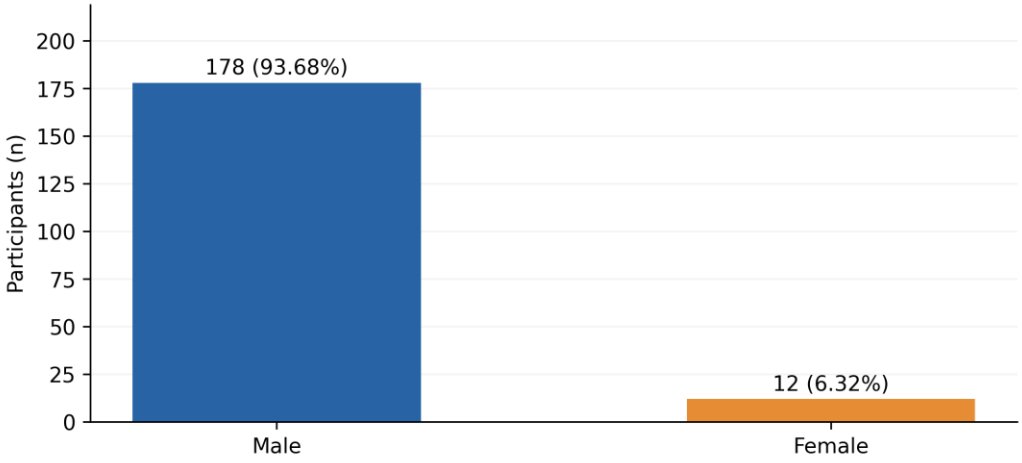

Figure 1. Sex distribution among the 190 recreational bowlers.

Interpretation. The study included predominantly male participants (93.68%).

Table 2. Hand Dominance

Hand dominance	n	%
Right	177	93.16
Left	13	6.84
Total	190	100.00

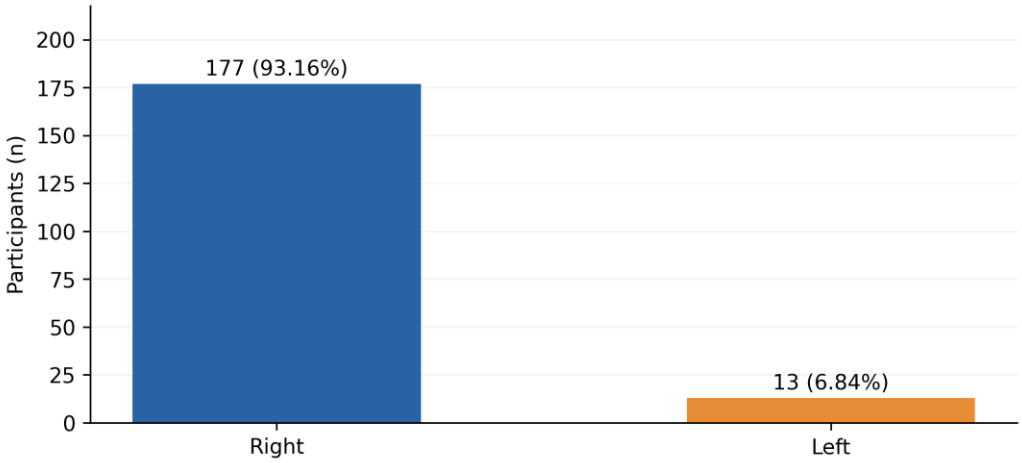

Figure 2. Distribution of hand dominance among recreational bowlers.

Interpretation. Right-hand dominance was reported by 93.16% of participants.

Table 3. Age Distribution

Age (years)	n	%
20	6	3.16
21	15	7.89
22	23	12.11
23	44	23.16
24	17	8.95
25	21	11.05
26	20	10.53
27	19	10.00
28	7	3.68
29	1	0.53
30	8	4.21
33	1	0.53
34	2	1.05
35	2	1.05
36	1	0.53
37	1	0.53
38	1	0.53
40	1	0.53

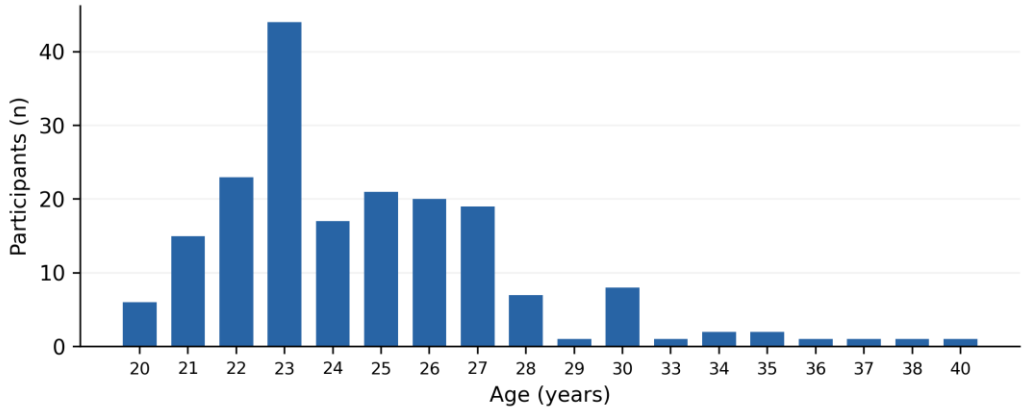

Figure 3. Frequency distribution of participant age (years).

Interpretation. The mean age was 24.77 years (SD = 3.44), with a median of 24 years (IQR = 3) and a range of 20–40 years.

Table 4. Cricket-Playing Experience

Experience (years)	n	%
0.25	1	0.53
1	21	11.05
2	54	28.42
3	46	24.21
4	29	15.26
5	24	12.63
6	8	4.21
7	2	1.05
8	1	0.53
9	2	1.05
13	1	0.53
17	1	0.53

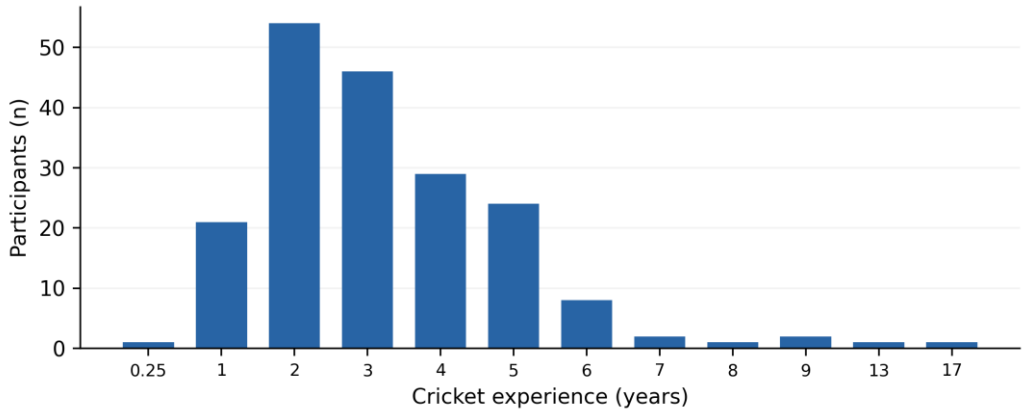

Figure 4. Frequency distribution of cricket-playing experience (years).

Interpretation. Mean cricket-playing experience was 3.27 years (SD = 2.00); the median was 3 years (IQR = 2).

Table 5. SPADI Scores

Domain	Mean (SD)	Median (IQR)	95% CI of mean
Pain	44.85 (25.00)	56 (30)	41.28–48.43
Disability	44.96 (24.96)	56 (33)	41.38–48.53
Total	44.85 (24.59)	57 (35.25)	41.33–48.37

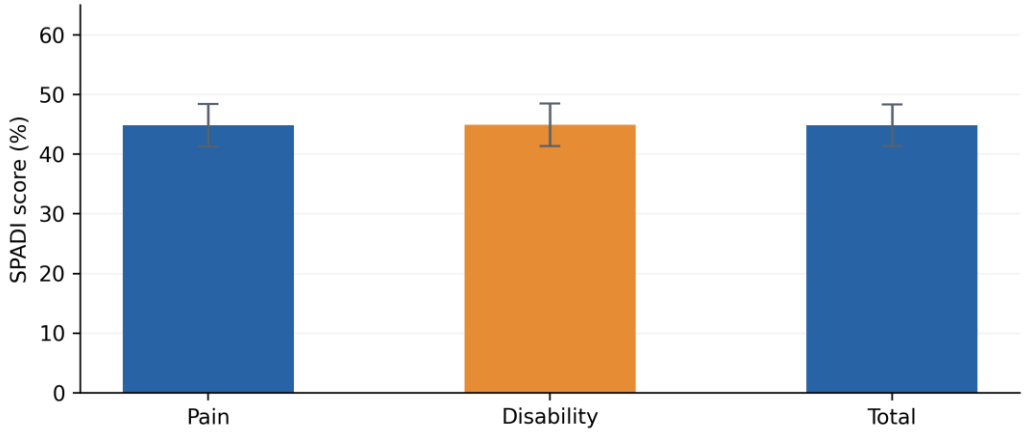

Figure 5. Mean SPADI percentages with 95% confidence intervals (error bars).

Interpretation. SPADI pain, disability, and total scores had similar mean values (approximately 45%). The total SPADI median was 57%. SPADI denotes the Shoulder Pain and Disability Index; higher values indicate greater reported pain or disability.

Table 6. Reported Shoulder Pain Prevalence

SPADI pain status	n	%	95% CI
Pain > 0	153	80.53	74.17–85.90
Pain = 0	37	19.47	14.10–25.83

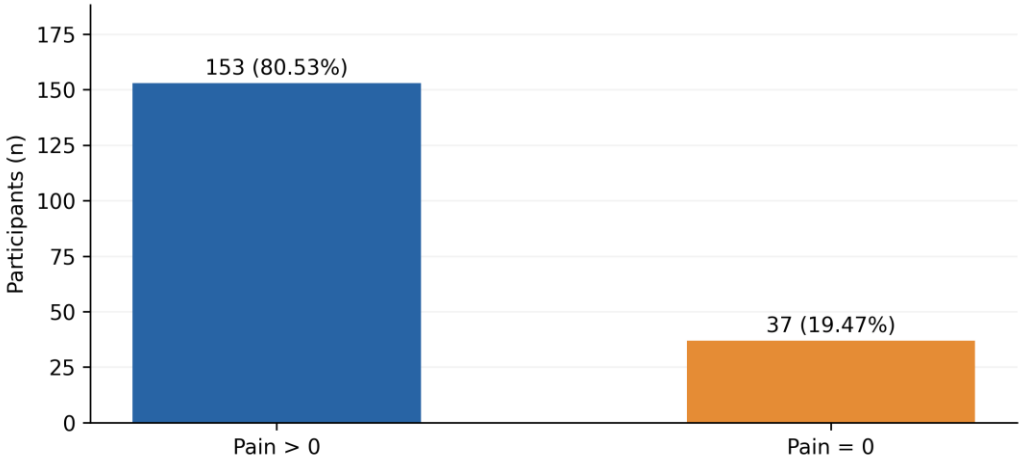

Figure 6. Proportion of participants with nonzero and zero SPADI pain scores.

Interpretation. Nonzero SPADI pain was reported by 153 of 190 bowlers (80.53%). This is the prevalence of reported shoulder pain, not clinically confirmed rotator cuff injury. CIs are exact binomial intervals.

Table 7. Shapiro–Wilk Normality Tests

Variable	W	p
Age	0.85663	< .001
Cricket experience	0.78546	< .001
SPADI pain	0.80906	< .001
SPADI disability	0.78457	< .001
SPADI total	0.76749	< .001

Interpretation. All five variables showed statistically significant departures from normality (all p < .001). Nonparametric methods were used for the exploratory independent-group comparisons and correlations. No graph is warranted for this assumption-check table.

Table 8. SPADI Comparisons by Sex

SPADI domain	Male median (IQR)	Female median (IQR)	U	Rank-biserial r	p (Holm)
Pain	56 (30)	51 (32.5)	1056.5	-0.011	1.000
Disability	56 (32.75)	52 (29.25)	1149	0.076	1.000
Total	57 (32.25)	52.5 (34.5)	1109	0.038	1.000

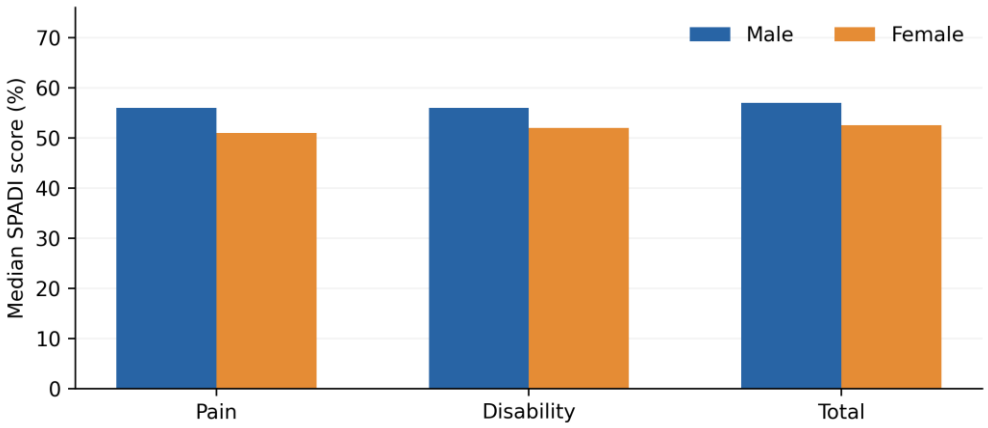

Figure 7. Median SPADI scores by sex; the chart displays group medians, not means.

Interpretation. No sex-related difference reached statistical significance following Holm correction. All three comparisons were exploratory; male n = 178 and female n = 12.

Table 9. SPADI Comparisons by Hand Dominance

SPADI domain	Right median (IQR)	Left median (IQR)	U	Rank-biserial r	p (Holm)
Pain	56 (34)	50 (12)	1395	0.213	.600
Disability	56 (35)	55 (7)	1256.5	0.092	.600
Total	57 (37)	55 (9)	1361	0.183	.600

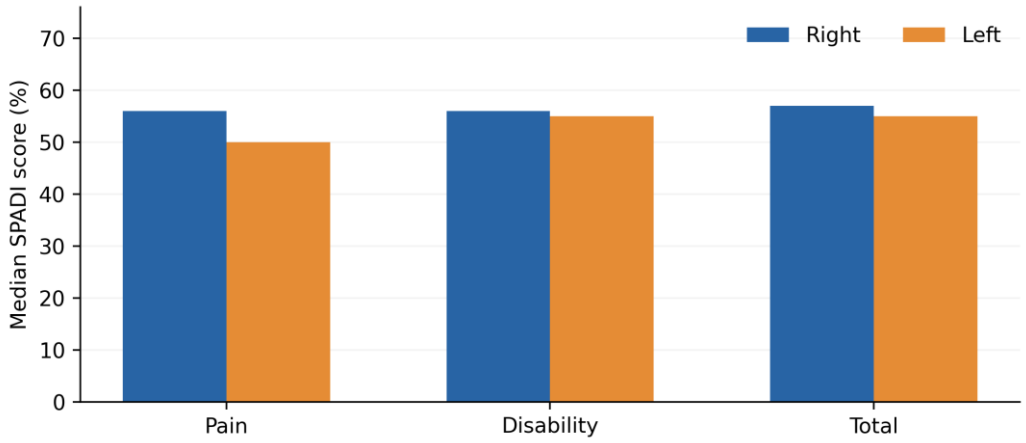

Figure 8. Median SPADI scores by dominant hand; no adjusted comparisons were significant.

Interpretation. Differences in SPADI pain, disability, and total scores by hand dominance were not statistically significant after Holm correction. Right n = 177; left n = 13.

Table 10. Age and SPADI Correlations

Domain	Spearman ρ	95% CI (516pprox..)	p	p (Holm)
Pain	.1956	.0547–.3288	.007	.021
Disability	.1052	−.0377–.2439	.148	.148
Total	.1656	.0239–.3009	.022	.045

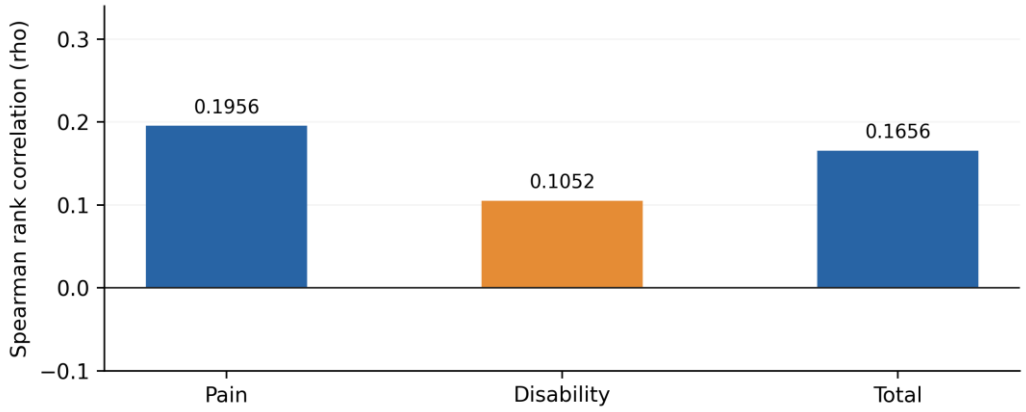

Figure 9. Spearman correlations of age with SPADI outcomes; bar heights show rho, not regression slopes.

Interpretation. Age demonstrated weak positive correlations with SPADI pain and total scores after Holm adjustment, whereas the disability correlation was not statistically significant. Confidence intervals are Fisher-z approximations.

Table 11. Cricket Experience and SPADI Correlations

Domain	Spearman ρ	95% CI (approx.)	p	p (Holm)
Pain	.0235	−.1193–.1653	.748	1.000
Disability	.0100	−.1325–.1522	.891	1.000
Total	.0119	−.1306–.1540	.870	1.000

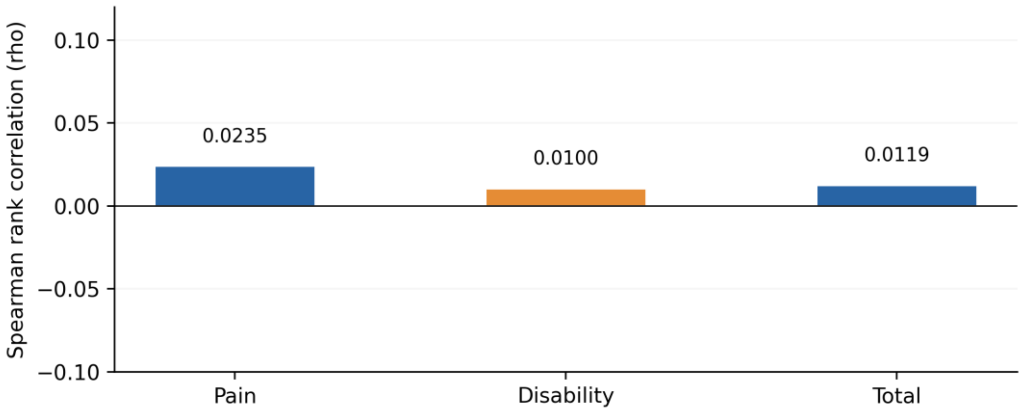

Figure 10. Spearman correlations between cricket-playing experience and SPADI outcomes.

Interpretation. Cricket-playing experience showed negligible correlations with each SPADI score; none was statistically significant after Holm adjustment.

Table 12. Reported Shoulder Pain by Sex and Hand Dominance

Grouping	Pain > 0, n/N (%)	Pain = 0, n/N (%)	Fisher p	Holm p
Male	141/178 (79.21)	37/178 (20.79)	.128	.255
Female	12/12 (100.00)	0/12 (0.00)		
Right	141/177 (79.66)	36/177 (20.34)	.469	.469
Left	12/13 (92.31)	1/13 (7.69)		

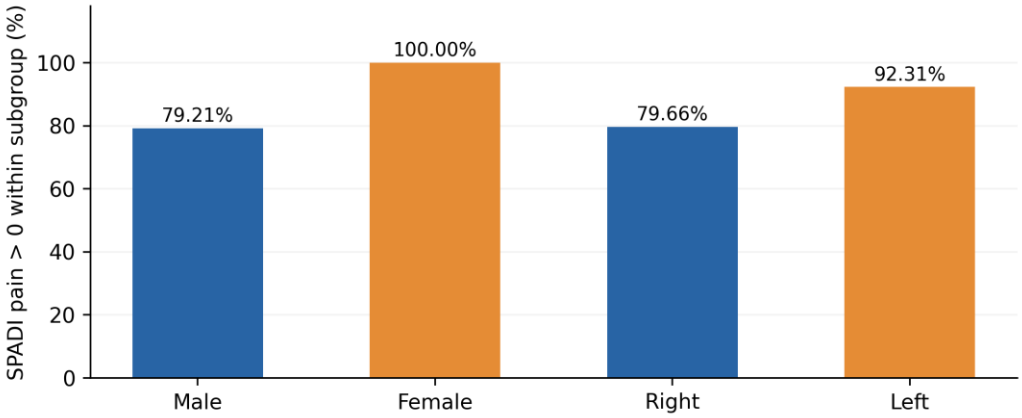

Figure 11. Percentage with nonzero SPADI pain within each sex and hand-dominance subgroup.

Interpretation. Fisher exact tests did not detect significant associations of nonzero SPADI pain with sex (adjusted p = .255) or hand dominance (adjusted p = .469). The sex table contained a zero cell, making its conditional odds-ratio estimate unbounded and imprecise.

RESULTS

A total of 190 recreational cricket bowlers were included in the study. The majority were male (178; 93.68%), and 12 (6.32%) were female. Most participants were right-hand dominant (177; 93.16%). The mean age was 24.77 ± 3.44 years, and the mean cricket-playing experience was 3.27 ± 2.00 years. The mean SPADI pain, disability, and total scores were 44.85%, 44.96%, and 44.85%, respectively. The scores ranged from 0–86% for pain, 0–83% for disability, and 0–84% for the total score.Shoulder pain symptoms, defined as a nonzero SPADI pain score, were reported by 153 participants (80.53%; 95% CI: 74.17–85.90%), while 37 (19.47%) had no reported shoulder pain. Nonzero disability and total SPADI scores were observed in 156 participants (82.11%). Normality testing showed significant deviations from normality ($p < 0.001$); therefore, nonparametric statistical tests were used. No significant differences in SPADI scores were found according to sex or hand dominance. Age showed weak but statistically significant positive correlations with SPADI pain ($\rho = 0.196$, adjusted $p = 0.021$) and total scores ($\rho = 0.166$, adjusted $p = 0.045$), while disability was not significantly correlated with age. Cricket-playing experience showed no significant correlation with any SPADI score.No statistically significant association was found between the presence of shoulder pain symptoms and sex ($p = 0.128$) or hand dominance ($p = 0.469$). Overall, the study found a high prevalence of self-reported shoulder pain symptoms (80.53%) and shoulder-related disability (82.11%) among recreational cricket bowlers. These findings indicate the presence of shoulder pain and disability symptoms assessed using SPADI and do not represent clinically confirmed rotator cuff injuries.

DISCUSSION

The present study aimed to determine the prevalence of shoulder-related symptoms among recreational cricket bowlers using the Shoulder Pain and Disability Index (SPADI). A total of 190 recreational bowlers participated in the study. The findings provide an understanding of shoulder pain and functional disability experienced by recreational bowlers and highlight the possible impact of repetitive overhead bowling activities on shoulder health. The study findings revealed that shoulder pain symptoms were commonly reported among recreational bowlers. A considerable proportion of participants experienced shoulder pain, indicating that shoulder-related problems may be an important concern even among individuals participating in cricket at a recreational level. This could be associated with repetitive bowling movements, inadequate recovery periods, improper bowling techniques, insufficient warm-up, and differences in physical conditioning. The shoulder joint plays an important role during the bowling action, particularly during the acceleration and deceleration phases. The rotator cuff muscles contribute to dynamic stability of the glenohumeral joint and help control shoulder movements during repetitive overhead activities. Continuous exposure to repetitive mechanical loading may contribute to shoulder pain and functional difficulties among bowlers (6,9). The findings of the present study are consistent with previous research conducted among recreational cricket bowlers, which reported the presence of glenohumeral internal rotation deficit. Altered shoulder mobility may influence shoulder mechanics and potentially contribute to shoulder-related symptoms during repetitive overhead activities (2). Similarly, previous research investigating shoulder instability among recreational and amateur fast bowlers has highlighted the occurrence of shoulder dysfunction in cricket-playing populations (1,3). Previous research involving elite female cricket players also identified shoulder injuries as an important musculoskeletal concern. Gradual-onset injuries associated with repetitive activities were commonly observed, particularly among players involved in frequent overhead movements. These findings support the importance of monitoring shoulder symptoms even when they do not result in complete restriction from sports participation (4). Similarly, research conducted among elite South African cricketers highlighted the occurrence of both time-loss and non-time-loss shoulder injuries. This suggests that players may continue participating in cricket despite experiencing shoulder-related symptoms, potentially delaying appropriate assessment and management (5). The present study further highlights the importance of identifying shoulder symptoms among recreational bowlers. In the present study, the mean SPADI pain and disability scores indicated that participants experienced varying levels of shoulder-related symptoms and functional limitations. Some participants reported considerable difficulty, whereas others experienced minimal or no symptoms. This variation indicates that shoulder problems do not affect all recreational bowlers equally and may depend on individual factors such as physical conditioning, playing habits and shoulder function. The study also demonstrated that shoulder pain and disability scores were not significantly different between male and female participants. Similarly, no statistically significant differences were observed between right-hand-dominant and left-hand-dominant participants. These findings suggest that the presence and severity of reported shoulder symptoms were not clearly associated with sex or hand dominance in the present sample. However, the smaller number of female and left-hand-dominant participants should be considered while interpreting these findings. A weak positive association was observed between age and shoulder pain scores, as well as overall SPADI scores. This suggests that increasing age may be associated with a slight increase in reported shoulder symptoms among recreational bowlers. However, the association was weak, and age alone cannot be considered a major determinant of shoulder pain based on the present findings. No significant association was identified between age and disability scores. Furthermore, cricket-playing experience did not demonstrate a significant association with shoulder pain, disability or total SPADI scores. This indicates that the number of years spent playing cricket did not necessarily correspond to the severity of shoulder-related symptoms in this study population. Other factors, such as bowling workload, training intensity, recovery time and physical conditioning, may also influence shoulder health. Previous research examining shoulder impingement among cricketers and rotator cuff muscle strength imbalance among collegiate cricket bowlers has highlighted the importance of shoulder muscle function and repetitive overhead loading in cricket-related shoulder problems (8,9). These findings provide additional support for the need to assess shoulder health and promote appropriate preventive strategies among recreational bowlers. The SPADI questionnaire provided a practical method of identifying self-reported shoulder pain and functional disability in the study population. It helped identify participants experiencing shoulder-related symptoms and provided information about their functional difficulties. However, SPADI is a patient-reported outcome measure and does not independently establish the presence of a structural rotator cuff injury (10). Overall, the findings of the present study indicate that shoulder pain and related functional symptoms are common among recreational cricket bowlers. The results emphasize the importance of early identification, appropriate shoulder conditioning, injury prevention and physiotherapy awareness in recreational cricket. However, further clinical assessment is necessary to determine whether these symptoms are specifically associated with rotator cuff pathology.

CONCLUSION

The present study concludes that shoulder-related pain and functional disability are common among recreational cricket bowlers. The findings indicate that a considerable proportion of participants experienced shoulder pain symptoms, highlighting the importance of shoulder health in individuals involved in repetitive overhead sporting activities. The study also identified variations in pain and disability levels among participants. No statistically significant differences were observed according to sex or hand dominance. Age demonstrated a weak positive association with shoulder pain and overall shoulder-related symptoms, whereas cricket-playing experience did not show a significant association with SPADI scores. The use of the Shoulder Pain and Disability Index provided useful information regarding self-reported shoulder pain and functional limitations among recreational bowlers.

Therefore, the study highlights the importance of early identification of shoulder symptoms, appropriate conditioning, preventive physiotherapy interventions and awareness regarding shoulder health among recreational cricket bowlers. However, the findings represent shoulder pain and disability symptoms rather than clinically confirmed rotator cuff injuries. Further clinical evaluation and diagnostic investigations are required to establish the actual prevalence of rotator cuff pathology in this population.

CLINICAL IMPLICATIONS

- The findings highlight the importance of regular shoulder screening among recreational cricket bowlers to identify shoulder pain and functional difficulties at an early stage
- Physiotherapists should educate bowlers regarding proper bowling techniques, adequate warm-up routines and appropriate recovery periods.
- Shoulder conditioning programmes focusing on rotator cuff strengthening, scapular stabilisation and shoulder mobility may help improve shoulder function.
- .Recreational bowlers experiencing persistent shoulder pain should be encouraged to seek appropriate physiotherapy assessment rather than continuing repetitive activities without adequate management.
- .Preventive physiotherapy programmes may help improve shoulder function, promote safe participation in cricket and reduce the potential impact of shoulder-related problems**.**

LIMITATIONS OF THE STUDY

- The study was conducted using a cross-sectional design; therefore, cause-and-effect relationships could not be established.
- Convenient sampling was used, which may limit the generalisability of the findings to the entire recreational cricket-playing population.
- The study included a relatively small proportion of female and left-hand-dominant participants compared with male and right-hand-dominant participants.
- Factors such as bowling workload, number of overs bowled, bowling technique, training intensity, warm-up practices and recovery periods were not comprehensively assessed.

FUTURE SCOPE OF THE STUDY

- Include clinical tests to confirm rotator cuff injuries.
- Investigate the relationship between bowling workload and shoulder problems.
- Evaluate the effectiveness of preventive physiotherapy programmes among recreational bowlers

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