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Prevalence of Musculoskeletal Disorders Amongst Recreational Cricket Players

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ABSTRACT

Background: The repetitive high-intensity movements of cricket, such as bowling, batting, sprinting and throwing result in substantial biomechanical stresses being placed on the musculoskeletal system. Although the epidemiology of injuries among elite cricketers has been well studied, available information is minimal about the frequency and prevalence of musculoskeletal disorders (MSDs) among recreational cricket players, especially in developing cricket nations with high rates of cricketing participation.
Objective: Exploring musculoskeletal disorders, with an emphasis on the prevalence and anatomical distributions in recreational cricket players 18–25 years of age.
Methods: A cross-sectional study was carried out among 130 amateur male cricket players, aged between 18 and 25 years. Eligible participants were drawn from cricket teams across the city. Musculoskeletal symptoms were measured using the Nordic Musculoskeletal Questionnaire (NMQ), which assesses symptoms in nine regions of the body in the previous 12 months and in the last seven days. Descriptive analysis was carried out in determining the prevalence of musculoskeletal symptoms in different regions of the body.
Results: The sample size for musculoskeletal disorders was 93.8%, suggesting that most players had symptoms in one or more of the anatomical regions. The lower back (38.5%) was the most commonly affected location, followed by the knee (29.2%), neck (28.5%) and shoulder (26.9%). Ankle/foot (23.8%), wrist/hand (23.1%) and elbow (20.8%) symptoms were also reported. Participants also frequently received reports of multi-site musculoskeletal symptoms.
Conclusion: Musculoskeletal disorders are common among recreational cricket players and the most likely affected areas involve the lumbar spine and lower limb. Such findings emphasize the importance of targeted injury prevention strategies comprising physiotherapy-based screening, biomechanical assessment, and tailored conditioning programs that reduce musculoskeletal disorders burden in recreational cricket populations.

Keywords: Cricket injuries; Musculoskeletal disorders; Nordic Musculoskeletal Questionnaire

INTRODUCTION

The participation rate in organized and recreational sports is increasing significantly worldwide, driven by a growing understanding of the health benefits of physical activity. Yet participation in sports with large numbers of active members is also associated with a high incidence of sports-related musculoskeletal injuries. Sports injuries make up a significant portion of musculoskeletal disorders worldwide, and in the

absence of adequate management have the potential to reduce physical activity, impair performance, and cause long-term disability. Epidemiologic evidence suggests that sports injuries account for 10%–19% of all injuries presenting to healthcare facilities in physically active populations, warranting the need for a comprehensive understanding of injuries by sport (1). Given this requirement, it is important to describe the prevalence and distribution of musculoskeletal disorders within specific sports to inform effective injury-prevention strategies.

Cricket offers many possible activities, but fast bowling is the most physically demanding. The bowling process consists of a high-speed run-up, rapid trunk rotation, lumbar extension, and powerful internal shoulder rotation at release. Biomechanical studies demonstrate significant ground reaction forces in fast bowlers during the delivery stride, reaching several times body weight (2). These forces are transmitted through the lower limbs and trunk and generate massive impact on the lumbar spine, knees, and adjacent soft tissues. As a result, lumbar spine injuries — such as stress fractures and chronic low back pain — are frequently reported among cricket bowlers (3).

Several injury surveillance studies have investigated the epidemiology of injuries in cricket, especially in elite and professional players. Orchard et al. conducted long-term injury surveillance among elite cricketers and found that the incidence of injury was around 64 injuries per 100 players per season (4). The study identified fast bowlers as the group most susceptible to injury, accounting for a substantial proportion of time-loss injuries. Similarly, Stretch reported that lower limb injuries, particularly hamstring strains, are the most common injury type in professional cricket, followed by lumbar spine injuries (5). These findings highlight the substantial musculoskeletal demands associated with cricket participation.

Lower back injuries have attracted more attention in cricket injury research as they are common amongst fast bowlers. Dennis et al. reported that excessive bowling workloads significantly increase risk for lumbar spine injury in fast bowlers (6). The survey found that bowlers who delivered a high number of overs within short time periods were more susceptible to overuse injuries to the lumbar area. Likewise, biomechanical studies have indicated that increased trunk rotation combined with lumbar hyperextension during mixed bowling can lead to increased stress on the pars interarticularis that increases the risk of stress fractures in players.

Cricket players also often suffer upper limb injuries, especially shoulder and elbow injuries. Repeatedly performing overhead throwing in fielding and bowling can cause stress to the rotator cuff muscles and elbow joint structures. Ranson and Gregory reported that shoulder injuries commonly occur in professional cricketers, mainly at throwing events within fielding positions (7). These injuries potentially bring a lower throwing velocity, reduced performance, and a prolonged absence from competitive play.

The Nordic Musculoskeletal Questionnaire (NMQ) is a widely used standardized method for assessing musculoskeletal symptoms in epidemiological studies. The questionnaire helps in determining the extent of musculoskeletal symptoms and its anatomical layout in various parts of the body during a specific recall period (8). Its reliability and low administrative complexity make it especially appropriate for large-scale population assessment of musculoskeletal disorders.

Although cricket is a universally popular sport, studies of the incidence of musculoskeletal disorders in recreational cricket players have become limited, especially from emerging cricketing countries like India, where participation levels are very high. There is a significant gap in research examining injury patterns among community-level athletes, despite the relatively large cohort of recreational cricket players. Accordingly, the current investigation seeks to explore the incidence and anatomical distribution of musculoskeletal disorders among recreational cricket players aged 18 to 25 years, using the Nordic

Musculoskeletal Questionnaire. The aim of this study is to provide evidence on the most frequently involved body regions and injury patterns in this group of individuals, which may help guide specific injury prevention programs and physiotherapy for recreational cricket players.

METHODOLOGY

Study Design

The present study has a cross-sectional observational design to ascertain the prevalence and anatomical distribution of musculoskeletal disorders in recreational cricket players. The data were collected following the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for cross-sectional studies. Data were collected during a single assessment period using a standardized questionnaire to assess musculoskeletal symptoms.

Participants

In total, 130 recreational male cricket players aged 18–25 years completed the study. We recruited participants from local cricket clubs and community-level cricket teams. Recreational players were defined as being regular cricket players, not registered as professional or elite-level athletes. Eligible participants required the following criteria to be included:

- Male cricket players between the ages of 18 and 25 years.
- Minimum of three years of cricket experience.
- Currently engaged in recreational cricket activities.

Participants were excluded if:

- They had a diagnosed neurological disorder affecting musculoskeletal function.
- Were undergoing treatment for an acute traumatic injury unrelated to cricket activity.
- Had not participated in cricket activities within the previous six months.

Sample Size Calculation

The required sample size for the present cross-sectional study was calculated using the standard formula for estimating prevalence in epidemiological studies. The expected prevalence of musculoskeletal disorders among cricket players was assumed to be 61%, based on findings from previous studies investigating musculoskeletal problems in cricket populations. Substituting the values into the formula yielded an initial sample size of 366 participants. Since the target population of recreational cricket players available in the study area was relatively small (N = 200), the Finite Population Correction (FPC) was applied to obtain a more accurate estimate of the required sample size. After applying the finite population correction, the calculated sample size was 129.6, which was rounded up to 130 participants. To account for potential non-response or incomplete data, an additional 5–10% buffer was considered; however, the final sample included 130 participants, all of whom completed the questionnaire.

Data Collection

Data were obtained through a structured questionnaire that includes demographic data and musculoskeletal symptoms. Participants completed the questionnaire during scheduled sessions at their respective cricket grounds or training facilities. All participants were informed of the purpose and procedures of the study and written informed consent was obtained prior to data collection. Demographic information: age, playing role (batsman, bowler, all-rounder, or wicket-keeper), playing experience, body mass index (BMI) and weekly training hours.

Outcome Measures

Musculoskeletal symptoms were evaluated by the Nordic Musculoskeletal Questionnaire (NMQ), a stand-

ardized and validated tool, as used commonly in epidemiological studies of musculoskeletal disorders. The NMQ assesses musculoskeletal symptoms in all nine anatomical regions: neck, shoulders, elbows, wrists/hands, upper back, lower back, hips/thighs, knees, ankles/feet. The questionnaire measures symptoms over two recall periods:

- 12-month prevalence of musculoskeletal symptoms
- 7-day prevalence of musculoskeletal symptoms

Participants were also asked whether the symptoms were having an impact on activity limitation or participation in cricket and/or activities of daily living.

Statistical Analysis

A statistical software package was used to enter all the collected data for statistical analysis. Demographic characteristics and prevalence of musculoskeletal symptoms were summarized using descriptive statistics. Continuous variables were presented as means and standard deviations; categorical ones were shown as frequencies and percentages. The total prevalence rates of musculoskeletal disorders were calculated as the number of participants reporting symptoms in the specified recall periods, per anatomical region. Further analyses were conducted to examine the distribution of musculoskeletal symptoms by playing role and weekly training duration.

Ethical Approval

Ethical approval for the study was obtained from the Institutional Ethics Committee of the respective academic institution prior to data collection. All procedures were conducted in accordance with the ethical standards outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants prior to participation in the study, and the confidentiality of the subjects was maintained throughout the research process.

RESULTS

The study was conducted with 130 recreational male cricket players, aged 18–25 years. The overall prevalence of musculoskeletal disorders among participants was 93.8%, suggesting that the majority of players experienced discomfort or pain in at least one anatomical region during the assessed recall period.

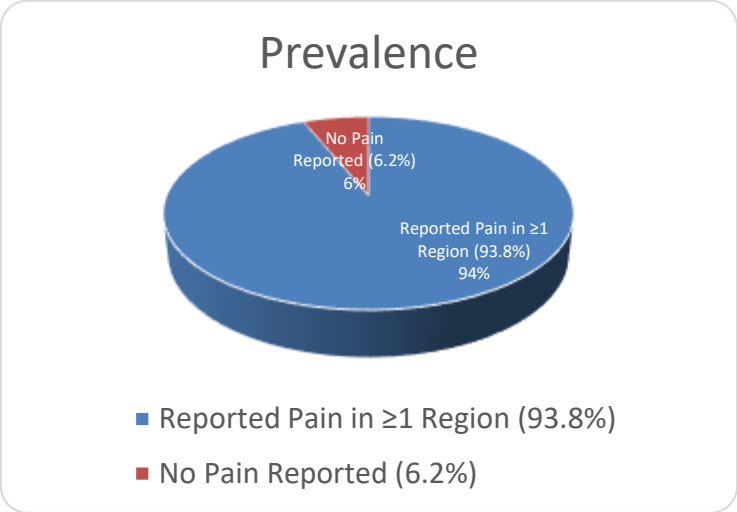

Figure 1: Overall 12-Month MSD Prevalence (n = 130)

Anatomical Distribution of Musculoskeletal Symptoms

Musculoskeletal symptoms spread differently across body parts. The lower back was the most commonly affected region, with a prevalence of 38.5%, indicating that lumbar spine complaints were a significant

musculoskeletal concern for recreational cricket players. The second most commonly affected region was the knee joint (29.2%), followed by the neck (28.5%). At 26.9% of players' symptoms related to the shoulder, due to repetitive overhead movements and throwing demands associated with cricket activities (bowling and fielding). This was observed at moderate prevalence in the ankle and foot region (23.8%) and the wrist and hand region (23.1%), indicating that both upper and lower extremities are extensively mechanically loaded during cricket involvement. The least prevalent region was the elbow (20.8%), but symptoms from this area were also reported in a notable proportion of participants.

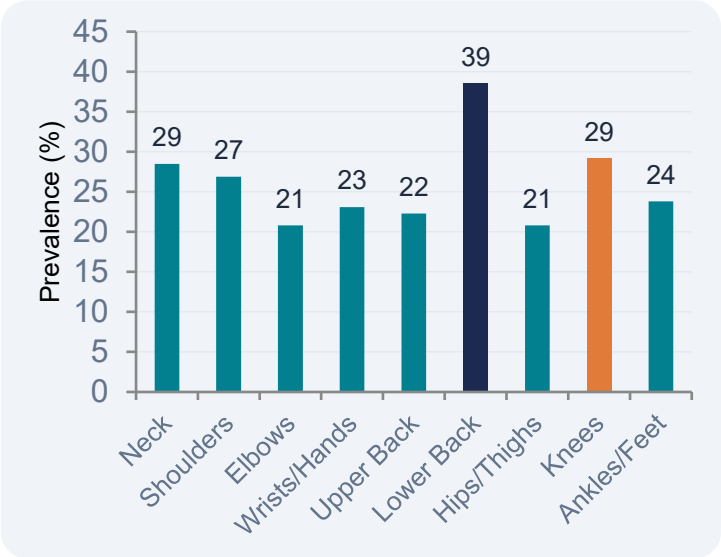

Figure 2: 12-Month MSD Prevalence by Body Region

Pattern of Musculoskeletal Involvement

The results show that musculoskeletal symptoms affected both axial and appendicular areas of the body. The high prevalence of lower back complaints suggests that lumbar spine loading during cricket-specific activities, such as bowling, batting, and prolonged fielding, may increase musculoskeletal stress in this region. Likewise, the high occurrence of knee and ankle symptoms indicates the repetitive sprinting and changes of direction which are common while fielding and running between wickets, as well as the high-impact forces encountered in sports involved. Shoulder, elbow, and wrist upper limb symptoms are most likely associated with repetitive throwing and batting mechanics and require a great deal of tension on upper extremity joints. Taken together the results indicate that musculoskeletal disorders are common in recreational cricket players, across multiple body parts, hence representing a significant impact of sport-related musculoskeletal problems in this population.

DISCUSSION

The study aimed to determine the prevalence and distribution of musculoskeletal disorders in recreational cricket players between the ages of 18–25 years. Musculoskeletal symptoms had a prevalence of 93.8%, and musculoskeletal complaints are common among recreational cricket players. The lower back, knees, and neck were found to be the most commonly affected areas. These results corroborate previous epidemiological studies demonstrating the considerable musculoskeletal demands of cricket participation. This high prevalence of musculoskeletal symptoms found in our study is consistent with previous injury surveillance studies in cricket. Orchard et al. reported that cricket players experience a considerable injury burden, with an annual injury incidence of approximately 64 injuries per 100 players per season among elite cricketers. Surveillance studies consistently identified fast bowlers as the group most at risk of

musculoskeletal injuries, due predominantly to repetitive biomechanical stress on the spine and lower limbs.

Stretch et al. reported that a significant proportion of injuries sustained by cricket players involved the lower limbs, primarily hamstring strains and knee injuries. Lumbar spine complaints were also commonly reported among bowlers due to the high mechanical loads generated during the bowling action.

Ranson and Gregory also highlighted shoulder injuries as a major concern for professional cricketers, particularly during throwing and fielding activities. Their study demonstrated that repetitive overhead throwing motions contribute to shoulder pain and dysfunction in a substantial proportion of cricket players.

Pardiwala et al. conducted a comprehensive review of cricket injuries and emphasized that both acute and overuse injuries are prevalent in cricket, particularly affecting the lumbar spine, shoulder complex, and lower extremities. They concluded that repetitive loading and inadequate recovery contribute significantly to the development of musculoskeletal disorders in cricket players. The results of the present study are in line with prior studies showing that recreational cricket players may experience similar injury patterns.

Lumbar spine abnormalities are among the most common disorders experienced in fast bowlers and some studies have demonstrated that rates of degeneration of lumbar disc in this group ranging from 21% to 65% have been previously reported (9). Additionally, lumbar stress fractures are also one of the most serious injuries in young fast bowlers and a leading cause of time lost from sport (10).

The knee joint was the second most commonly injured area in the current study. Cricket consists of sprinting between wickets, rapid deceleration, pivoting during fielding, and high-impact loading during bowling delivery strides. Such activities subject the knee joint to repetitive mechanical load, which can cause overuse injuries, e.g., patellofemoral pain syndrome, ligament strain, or tendinopathy. Epidemiological studies in cricket have also shown that knee injuries are among the most common lower-limb injuries reported by players (11)

Interestingly, the relationship of the weekly training volume with musculoskeletal symptomatology did not exhibit a clear linear relationship in the current study. While higher training loads are known to contribute to injury prevalence, sports-related musculoskeletal disorders have been widely acknowledged as the result of a multifactorial disorder state. A combination of biomechanical technique, muscle strength, flexibility, workload spikes, playing surface characteristics, and recovery may contribute to the development of injury risk (12).

This study highlights the imperative of preventive physiotherapy interventions and injury surveillance programs in recreational cricket. Pre-participation musculoskeletal screening and monitoring workload, as well as conditioning programmes targeting core stability, lower limb strength, and shoulder stabilization may potentially reduce injury vulnerability. And there are also significant potential benefits of informing players about suitable warm-up programs, correct biomechanics, and early symptom recognition to prevent adverse injuries. Although this study contributed valuable insights, it has several limitations.

Therefore, the cross-sectional design limits the ability to establish causal links between risk factors and musculoskeletal complaints. As well as this, the Nordic Musculoskeletal Questionnaire is self-reported and the participants' symptoms may not fit an objective clinical examination, making it susceptible to recall bias. Future research should adopt longitudinal study designs with biomechanical assessment and clinical evaluation to better understand the temporal relationship between cricket participation and the development of musculoskeletal injuries.

Conclusion

The findings of this study indicated that musculoskeletal disorders are common among recreational cricket players aged 18–25 years. The most frequently affected areas of the individual are the lower back, knees, and neck. Such data highlight the need to optimize injury-prevention programming for biomechanical exercise, physical conditioning plans, and physiotherapy-led screening initiatives in recreational cricket settings. For future studies, longitudinal designs and biomechanical characterisation will contribute to our understanding of the mechanisms of musculoskeletal injuries in cricket players.

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