

Frequency of Musculoskeletal Symptoms among the Club Cricketers of Rawalpindi/Islamabad

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ABSTRACT

Background of the study: The concept of playing and watching cricket in Pakistan is very common among youth; being considered a leisurely gentleman's game. However, the possible injuries that occur involving the musculoskeletal (MSK) system can be due to several causes such as improper training schedule, sudden involuntary movements, or the lack of proper warm-up/cool-down session. To contribute for betterment, our study aimed to determine the frequency of musculoskeletal symptoms among club cricketers.

Methodology: This was a descriptive cross-sectional study with a sample size of 344 male participants. The data collection tools which were used involves a self-structured Questionnaire for demographics and a modified Nordic Musculoskeletal Questionnaire for musculoskeletal symptoms. Data was analyzed on SPSS version 21.

Results: The frequency of MSK symptoms reported in the previous 12 months was

highest for lower back pain (n=98, 28.5%) followed by shoulder pain (n=98, 28.5%) while during the last 7 days upper back n=20 (54.1%) was reported as the highest one followed by knees n=28 (49.1%). During past 12 months, cricketers were unable to perform daily tasks due to discomfort, seen in knees n=35 (61.4%) followed by upper back n=19 (51.4%) and shoulder n=44 (44.9%). The maximum number of players who had hurt their body regions in accidents were highest with wrist n=22 (36.1%), ankle/foot n=23 (33.3%) and knees n=15 (26.3%).

Conclusion: Musculoskeletal symptoms in club cricketers were most commonly found in the shoulder and lower back region, however, they were least common in upper back.

Keywords: *Cricketers, Global Burden of Disease, Modified Nordic Questionnaire, Musculoskeletal Symptoms, Physical Activity, Recreational Sports.*

INTRODUCTION

Sports is considered a magnanimous activity that streams the crowd and can be used as a plugging aid for politically and ideologically trading purposes. Participation in sports helps the participant to remain physically active throughout the life.

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Cricket is one of the sports that is considered a leisurely, gentlemen's game. It is now played in over sixty countries and is considered a primary international team sport. Moreover, it is also played in many commonwealth countries as a popular recreational game. Cricket is the most popular team sport in the Indian subcontinent including India, Pakistan, Afghanistan, Bangladesh, and Sri Lanka. Taking part in cricket can improve bodily health and fitness, providing psychological benefits to individuals with improved self-esteem, social connections, and overall well-being. Mental health and health-related quality of life (HRQoL) are better in cricketers than in the general population.¹ However, various causative factors can cause hindrance to the players from performing their active role in sports which can result in various types of injuries as well. Therefore, it is crucial to devise new strategies that can be beneficial in upgrading the performance of athletes. By Oral et al. bowling, batting, and fielding are recognized as the three distinctive features of cricket. Because of its recurring nature, these often correlate with increased possibility of musculoskeletal symptoms such as pain or injury. Thus, players are prone to complicated injuries resulting from many causative factors such as sudden rotational movements while striking a target, bony spurts while training on an uneven surface, bumping with other players, or being walloped by a ball. These factors can result in a variety of micro or macro traumas to the cartilage among the players². Among the injuries that can occur to the batsman, strains particularly in the hamstrings, injuries to wrist /hand or involvement of lower spine are considered to be most frequent. Mostly, the injuries prevailing in the batsman can be due to the recurring nature or strength disproportion in players. These strains can also be due to various risk factors such as the over activation of any weakened or improperly trained muscle³. Musculoskeletal symptoms refer to an injury/trauma to muscles, joints, bones, cartilage, ligaments, fascia, nerves, and soft tissues; leading to pain, movement restrictions, muscle weakness, and ultimately loss of function⁴. Moreover, the International Olympic Committee defined musculoskeletal injury as frequent complaints incurred during competition and training that require medical attention; despite probable absence from competition and training³. According to the Global Burden of Disease and Risk Factors study (GBD), it is reported that of all musculoskeletal illnesses, more than 15% of injuries were reported in 1990 and predicted the rise of these injuries to 20% by 2020. By the update given in 2010 by GBD while validating this trend; there was a significant increase in injuries by about 84% from 1990 to 2010⁴. These results propose a remarkable, but general global burden of injury as well as musculoskeletal disease. In Lower Middle-Income Countries LMICs, the all-inclusive occurrence of musculoskeletal injury ranges from 779 to 1574 per 100,000 persons-years according to the best available estimation⁵. In accordance to WHO, musculoskeletal symptoms are thought to be extremely nerve racking for the physical damage associated with it. High incidence of injury in young cricketers is the direct variation of the number of playing hours. Musculoskeletal injury leads to decrease in players' overall performance or disengagement from competitions declining the explicit costs³. Injury during game can result from various inherent or extraneous components. According to research, the preceding element contributes to about fifty to seventy percent of injuries among the players⁶. In order to amplify the performance of a team; particular training programs focusing on power, endurance or speed should be established⁷. Coaches and physiotherapists can perform a vital role in keeping an eye on the pervasiveness of musculoskeletal injuries by introducing physical and psychological guidance with proper rehabilitation care plan⁸. Physical activity can result in many positive healthcare outcomes for the individual. However, cricket requires quite more physical exertion, so it is also essential to realize the injurious effects on cricketers' health in orde to alleviate the injury prevalence and enhance players' performance. Moreover, understanding the potential negative consequences of long-term sports participation is also very important⁹.

The Modified Nordic Musculoskeletal Questionnaire, (NMQ), is commonly used to gather data on musculoskeletal (MSK) symptoms. The NMQ can locate symptoms within particular regions, however it is insufficient in diagnosing their origins.

Though cricket is regarded as popular, we encounter a lack of surveillance data to emphasize club cricketers (bowlers, batsmen and all-rounders of Pakistan). This research will fill this gap by assessing the frequency and distribution of muscle and joint symptoms among club cricketers. The areas we have identified will provide a starting point for investigating other symptoms and risks that could be interrelated, leading to more effective methods of prevention and intervention.

METHODOLOGY

It was a Descriptive cross-sectional survey. The study duration was 1 year from February 2022 to February 2023. The data was collected from Pakistan's twin cities, including Rawalpindi and Islamabad. Non-probability consecutive sampling technique was used. Sample size was calculated by using the Rao soft sample size calculator. Margin of error was kept at 5%, confidence level at 95%, response distribution at 50% and population size at 3240, the sample size was 344.

Selection Criteria:

- Male cricketers, all-rounders, batsmen, wicketkeepers, and bowlers (tape and hard ball).
- Age group between 15 to 40 years.
- Players with playing experience of at least one year.
- Players playing thrice a week.
- Players playing at least 2-5 hours a day were all included.

While players taking any performance-enhancing drugs, those with known hypertension and diabetes or having known congenital, musculoskeletal, neuromuscular, psychiatric and cardiac disease were all excluded.

The Nordic Musculoskeletal Questionnaire has been used to assess the severity and impact of musculoskeletal symptoms in occupational groups¹⁰. The Nordic Musculoskeletal Questionnaire (NMQ) (Cronbach's Alpha = 0.896, sensitivity = 100%, and a specificity of 88%)¹¹ was introduced with the purpose of standardized testing and making comparisons among low back, shoulder, and general complaints of whole-body aches in epidemiological studies. The NMQ can be either used as a questionnaire or a structured interview¹². The questionnaire recognizes areas of a body having musculoskeletal problems assisted by a body map to indicate symptomatic areas i.e. neck, upper back, lower back, shoulders, elbows, hands/wrist, hip/thighs, knees, ankles/feet¹³.

Data was collected face to face using a questionnaire from participants who met the inclusion criteria. After obtaining consent, data and a self-structured questionnaire were collected to exclude the individuals who did not meet the inclusion criteria. Then Modified Nordic Musculoskeletal questionnaire was delivered in complex form in person for data collection. Participants were asked to mark the best possible answer for each question. The data obtained was kept confidential and participants were informed about the general outcomes and results of the study and they were given the right to withdraw from the study.

The data was entered and analyzed using SPSS-21 software. Regarding the Modified Nordic Musculoskeletal Questionnaire; results were assessed as frequencies and percentages.

RESULTS

A total of n=400 participants were targeted, out of which n=344 male participants (active cricket club members) met the inclusion criteria and were recruited in the study. The mean age of the participants was 21.93 with a standard deviation of ± 4.62 .

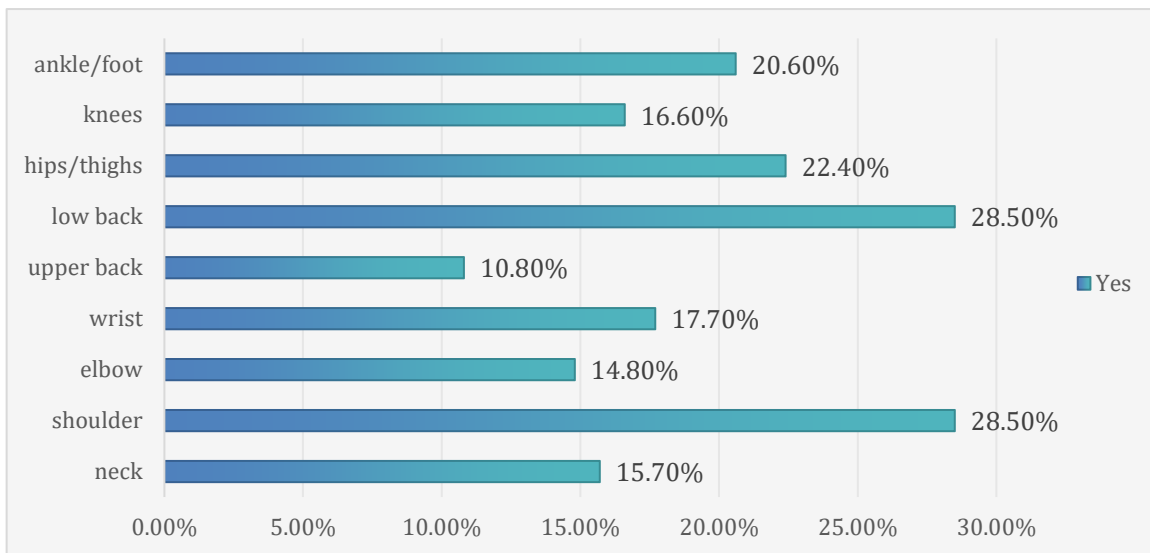


Figure-1 Musculoskeletal symptoms in the past 12 months

According to the Modified Nordic Musculoskeletal Questionnaire, the most commonly affected regions were the lower back (n=98, 28.5%) and shoulders (n=98, 28.5%), followed by the hips/thighs (n=77, 22.4%), ankles/feet (n=71, 20.6%), wrists (n=61, 17.7%), knees (n=57, 16.6%), neck (n=54, 15.7%), elbows (n=51, 14.8%), and upper back (n=37, 10.8%). Among club cricketers, the lower back and shoulders were the most affected regions, while the upper back was the least affected.

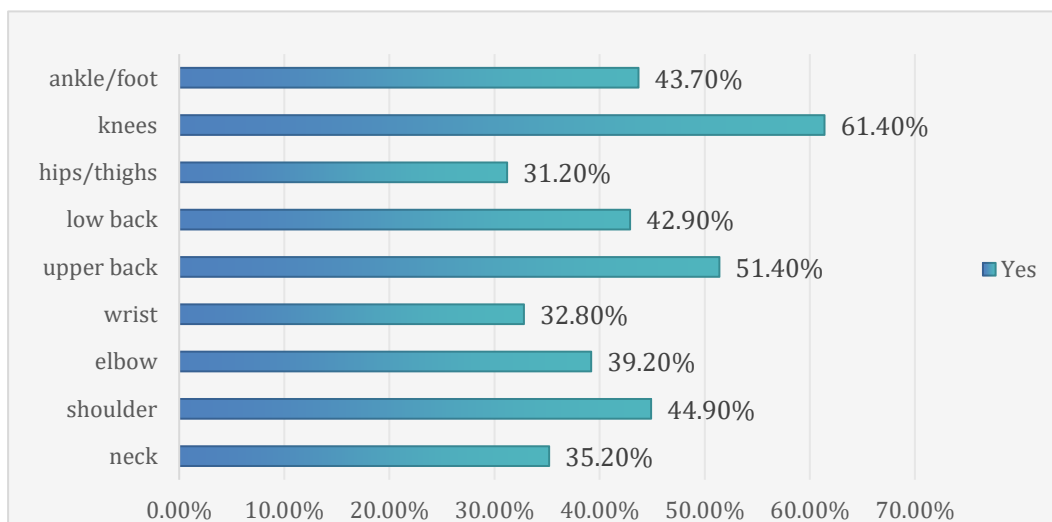


Figure-2 Activity limitation in the past 12 months

The most common region causing activity limitation was the knees (n=35, 61.4%), followed by the upper back (n=51, 51.40%), shoulder (n=44, 44.9%), ankle/foot (n=31, 43.7%), and lower back (n=42, 42.9%). The discomfort experienced in these areas restricted players' participation in training sessions and other playing activities. Additionally, other affected regions included the hips/thighs (n=24, 31.2%), elbow (n=20, 39.2%), neck (n=19, 35.2%), wrist (n=20, 32.8%), and upper back (n=19, 51.4%). The shoulder was the most affected region (61.40%), while the hips/thighs were the least affected (31.20%).

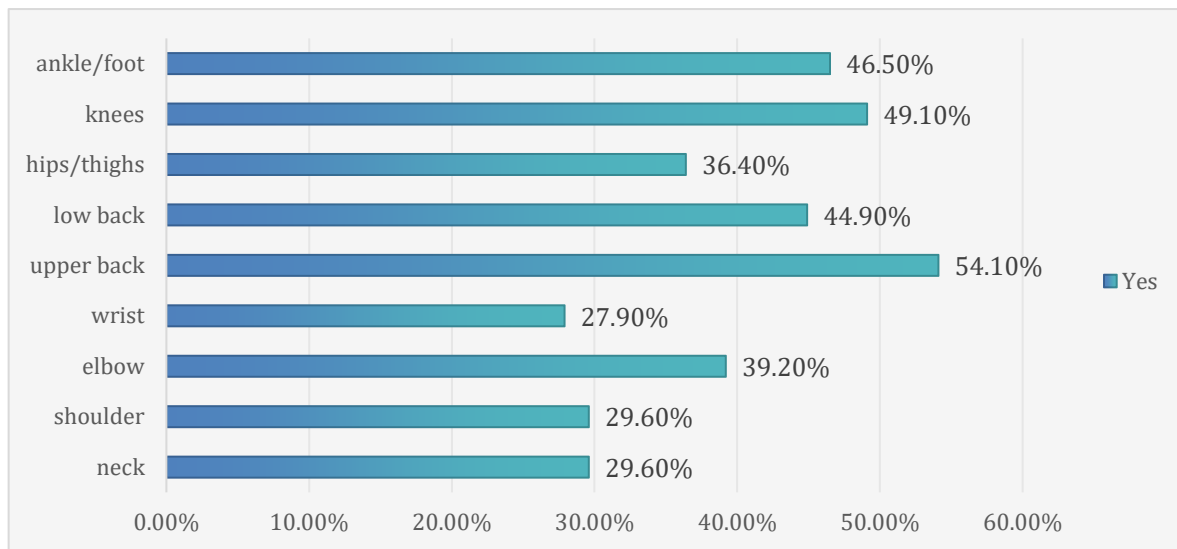


Figure-3 Musculoskeletal symptoms in the past 7 days

The highest number of participants who reported discomfort in various body regions over the past 7 days were as follows: upper back (n=54, 54.1%), knees (n=28, 49.1%), ankle/foot (n=33, 46.5%), lower back (n=44, 44.9%), elbow (n=20, 39.2%), hips/thighs (n=28, 36.4%), followed by shoulder (n=29, 29.6%) and neck (n=16, 29.6%) resulting in same percentage.

Additionally, other individuals reported discomfort in the upper back (n=20, 54.1%) and wrist (n=17, 27.9%). The upper back (n=54, 54.1%) was the most affected region, while the wrist (n=17, 27.9%) was the least affected.

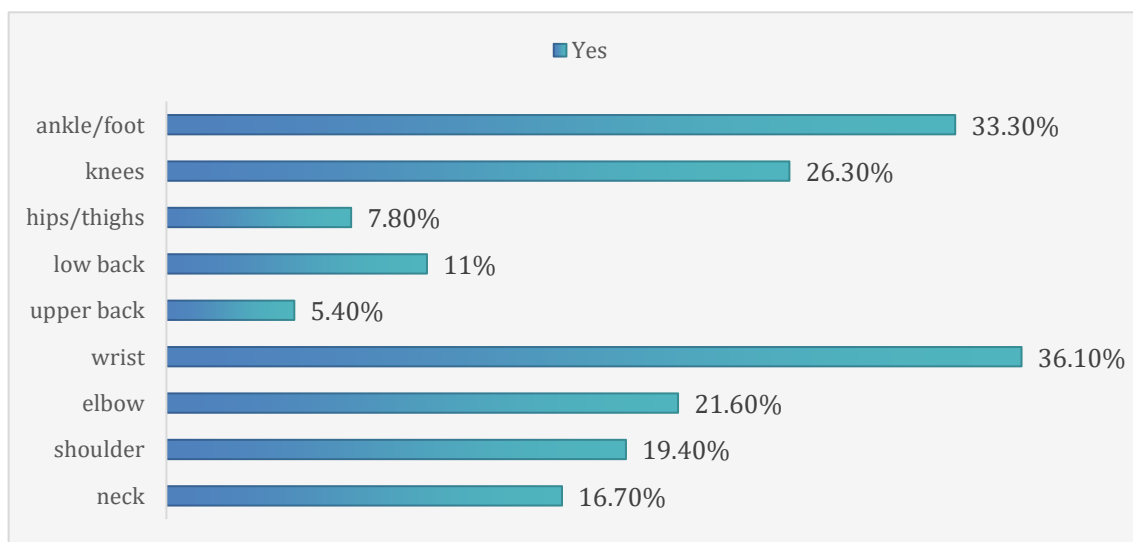


Figure-4 Any injury due to an accident

The highest number of players who sustained injuries in accidents had the following affected body regions, listed from most to least affected: wrist (n=22, 36.1%), ankle/foot (n=23, 33.3%), knees (n=15, 26.3%), elbow (n=11, 21.6%), shoulder (n=19, 19.4%), neck (n=9, 16.7%), lower back (n=11, 11%), hips/thighs (n=6, 7.8%), and upper back (n=2, 5.4%). The wrist (n=22, 36.1%) was the most affected region, while the upper back (n=2, 5.4%) was the least affected.

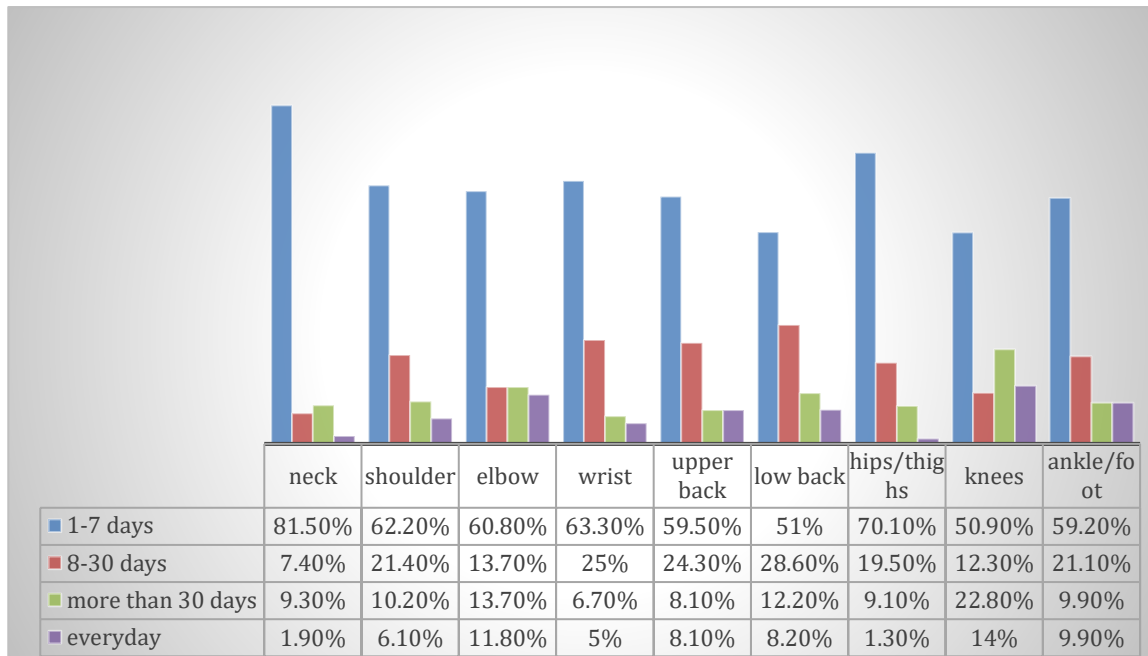


Figure-5 Period of musculoskeletal symptoms in the past 12 months

Among the 98 participants with low back discomfort, 50 (51%) experienced it for 1-7 days, 28 (28.6%) for 8-30 days, 12 (12.2%) for more than 30 days, and 8 (8.2%) reported experiencing discomfort daily. For the 98 participants with shoulder discomfort, 61 (62.2%) reported discomfort lasting 1-7 days, 21 (21.4%) for 8-30 days, 10 (10.2%) for more than 30 days, while 6 (6.1%) experienced daily discomfort.

Among the 54 participants with neck discomfort, 44 (81.5%) had discomfort for 1-7 days, 4 (7.4%) for 8-30 days, 5 (9.3%) for more than 30 days, and 1 (1.9%) reported daily discomfort. Of the 51 participants with elbow discomfort, 31 (60.8%) reported discomfort lasting 1-7 days, 7 (13.7%) for 8-30 days, 7 (13.7%) for more than 30 days, and 6 (11.8%) experienced daily discomfort.

For the 60 participants with wrist discomfort, 38 (63.3%) reported 1-7 days of discomfort, 15 (25%) for 8-30 days, 4 (6.7%) for more than 30 days, and 3 (5%) experienced daily discomfort. Among the 37 participants with upper back discomfort, 22 (59.5%) reported 1-7 days, 9 (24.3%) for 8-30 days, 3 (8.1%) for more than 30 days, and 3 (8.1%) experienced daily discomfort.

For the 77 participants with hip/thigh discomfort, 54 (70.1%) had discomfort for 1-7 days, 15 (19.5%) for 8-30 days, 7 (9.1%) for more than 30 days, and 1 (1.3%) reported daily discomfort. Among the 57 participants with knee discomfort, 29 (50.9%) experienced it for 1-7 days, 7 (12.3%) for 8-30 days, 13 (22.8%) for more than 30 days, and 8 (14%) had daily discomfort. For the 71 participants with ankle/foot discomfort, 42 (59.2%) reported 1-7 days, 15 (21.1%) for 8-30 days, 7 (9.9%) for more than 30 days, and 7 (9.9%) experienced daily discomfort.

Across all regions, 1-7 days was the most common duration of discomfort.

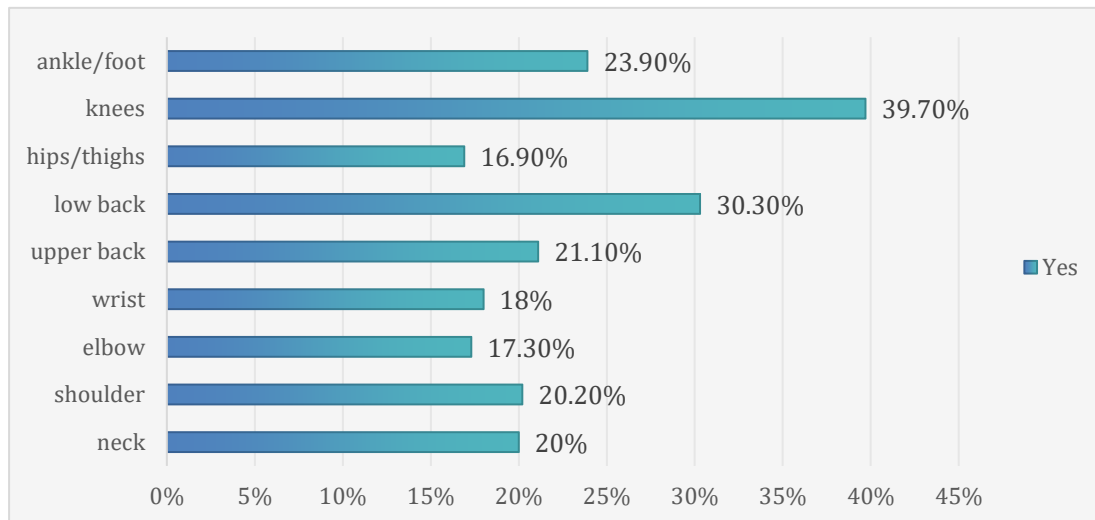


Figure-6 Physician visit due to musculoskeletal symptoms in the past 12 months

The highest number of players who visited a physician due to musculoskeletal symptoms were affected in the following body regions: lower back (n=30, 30.3%), knees (n=23, 39.7%), shoulders (n=20, 20.2%), ankle/foot (23.9%), hips/thighs (n=13, 16.9%), wrist (n=11, 18%), upper back (n=8, 21.1%), elbows (n=9, 17.3%), and neck (n=11, 20%). The most frequent physician visits were for lower back pain, while the least frequent were for neck pain.

This study also found that the majority of club cricketers reported discomfort in the lower back (n=98, 28.5%) and shoulder (n=98, 28.5%), whereas the least affected region was the upper back (n=37, 10.8%).

DISCUSSION

The current study focused on determining the frequency of musculoskeletal symptoms among the club cricketers of Rawalpindi/Islamabad. This study was conducted in this population, particularly for the first time in Rawalpindi/Islamabad. A comparative study was conducted in 2022 by I Sulaiman, K Shakira, and Vijay Krishna Kumar in Bangalore to check hamstring flexibility between male and female cricketers with low back pain because the hamstring muscle tightness results in a decreased range of motion at the lumbar spine and thus, associates with low back pain. This study found that male cricketers have less hamstring flexibility showing a high prevalence of low back pain. This study coincides with our study in a way that the population which was enrolled in our study was subjected to sudden rotational movements which resulted in causing low back pain with a high prevalence of 28.5%¹⁴. A recent study by L. Sheeran in 2021 concluded that low back pain was most prevalent among athletes¹⁵. Furthermore, a comparative study was conducted by Anthony Lucente et.al in 2021 to determine the characteristics of male and female elite cricketers and make a comparison between those who developed and those who did not develop lumbar fractures. Results depicted that young bowlers were more prone to lower back injuries targeting the lumbar spine than non-bowlers¹⁶. Moreover, a retrospective cross-sectional study was conducted in 2015 by Sumit Kumar et.al. to determine the prevalence of musculoskeletal disorders among the cricketers of Haryana. The results inferred that the trunk and lower limbs were the main areas of injuries among the participants¹³. The results of all these studies are in synchrony with the findings of our study showing the lower back as the most affected region among the club cricketers which might be due to significant biomechanical involvement. Possible factors resulting in low back pain could be the sudden hyper extension of the trunk while bowling, lateral bending of the trunk, or repeated throwing that contribute to increased loading on the lumbar spine. These results

are further reinforced by a systemic review with a meta-analysis conducted in 2021 on adolescent athletes to check the prevalence and incidence of low back pain. The study concluded that among adolescent athletes, low back pain was common in correspondence to our research showing a high prevalence of low back pain among club cricketers i.e. 28.5%¹⁷.

Recent evidence in 2021 concluded that cricketers were more prone to injuries comprising about 69.2% of total injuries among all sports players. Moreover, the commonest sites where these injuries occurred were the shoulder (11.6%), spine (15.2%), knee (14.7%), and hips/thighs (24.7%)¹⁸. Correspondingly, these studies support our results by showing the shoulder as the commonest site of discomfort among our players with a percentage of (28.5%) followed by hips/thigh (22.4%) and knees (16.6%), sequentially¹⁹. Mathias B Forrester conducted a study in 2021 and found 13,729 cricket-related injuries (68.5%) involving participants of the older age group (20-39 years). During the conduct; lacerations, muscle injuries, ligament injuries, bone fractures, and contusions were seen in the upper extremity, head, and neck. On further examination, finger or hand fractures seemed to be 10.8%, face laceration 10.3%, and finger/hand laceration 8.4% of estimated injuries; thus, reinforcing our given results²⁰. A cross-sectional study was conducted in 2020 by Muhammad Forhadul Hoque and Atiqur Rehman Khan to find out the prevalence of musculoskeletal symptoms and associated causes endured by domestic cricketers during matches. According to the study results, maximum symptoms (42.9%) were to be seen during running, shoulder region accounted for 19.7%, supporting our study results while the hamstrings account for (13.6%) and the face (4.9%)²¹. Benita Olivier, et al conducted research in 2020 to find the occurrence of shoulder injuries in the first 3 months of the cricket season in club cricketers which concluded that n=9 out of n=32 participants experienced dominant shoulder injury comprising 28.1%¹⁹. Moreover, this data corresponds with our present study which concluded that shoulder injury makes up 28.5% of musculoskeletal injuries in all participants. A longitudinal study was conducted by Rashaduzzaman et al. in 2019 to identify the incidence of cricket-related musculoskeletal symptoms among cricketers aged between 10 to 19 years old during matches. Their results assists our study results showing musculoskeletal discomfort with the maximum upper limb problems accounting for shoulder region 33.3%, elbow 21.6%, wrist 27.5% and hand pain 17.6%⁸. A recent study was conducted in West Bengal to determine the occurrence of sports injuries among cricketers. The results inferred that the majority of injuries were reported at the wrist (18.5%) followed by ankle/foot (17.7%), knee (9.7%), hip (9.7%), neck (5.6%), and elbows showing a percentage of (4%)²². Furthermore, a prospective cohort study was conducted in 2019 to determine the injury levels and mechanisms of injury among the cricketers. The study concluded that wrist/hand (19.8%), and lumbar spine (16.5%) were the most prevalent injuries in female cricketers. Consequently, these study goes in contrast with our findings where shoulder and low back are the most prevalent areas for musculoskeletal symptoms, followed by the wrist (17.7%), ankle/foot (20.6%), knees (16.6%), hips/thighs (22.4%), neck (15.7%) and elbow (14.8%)²³. A prospective longitudinal study was conducted in 2018 to determine the injury prevalence among junior cricketers in Sri Lanka. The results inferred that the most prevalent sites of injuries were knee (13.1%), hand (10.3%), lower back, and thighs accounting for about only 8% of injuries among the players. In contrast, our study results reveal the lower back as the most prevalent site of discomfort among our participants, accounting for 28.5% of injuries²⁴. Another study showed that knee pain is more prevalent than low back pain, which is not in synchrony with our study which shows low back pain as more prevalent than knee pain. Similarly, the elbow pain in their study was more prevalent than neck pain, and wrist pain was less prevalent than elbow pain which also does not synchronize with our study results²⁵. This analysis can help explain the gap between the results by focusing on the geographical location and the differences between the facilities available to club cricketers in Pakistan and other countries. The wide range of these MSK dysfunctions in cricketers has various factors such as not having enough awareness about physiotherapy services and its benefits, coaches lacking sufficient knowledge on biomechanics,

and an overall insufficient understanding with regards to injury prevention and rehabilitation. Furthermore, the restricted diet of club cricketers in Pakistan can also affect their performance and risk of injury. Such restrictions indicate the need to further indicate how these elements impact biomechanics and injuries related to cricket. A systemic review was conducted by Geordie McLeod et al in 2020 to find the number, nature, mechanism, and severity of sustained injuries in community-level cricketers. The type of injuries leading to physician visits by players included primarily fractures, dislocations, sprains, strains, bruising, and open wounds. The most frequent injuries resulted from players being struck by the ball. Limited access to healthcare reduces physician visits for musculoskeletal issues, leading athletes to rely on self-management or delay treatment until symptoms worsen. In contrast, readily available sports medicine specialists and physiotherapists encourage timely medical care and injury management. Cultural perceptions influence healthcare utilization with some athletes normalizing pain and underreporting injuries, while others prioritize prevention and seek medical care even for minor symptoms. This contributes to variations in injury reporting and treatment-seeking behaviour among cricketers²⁶. The generalizability of the study could be questioned; thus, further studies should be done including female cricketers to evaluate further causes behind the results obtained. Furthermore, there is a possibility of recall bias as the participants may forget the information of past 12 months about their symptoms.

CONCLUSION

It was concluded that the target group most commonly reported ergonomic issues regarding the shoulder, lower back, and hip/thigh areas over the last 12 months. Most participants reported problems with upper back, knees, and ankle/foot discomfort within the past week. The conditions impacted most participants' activities, including performing basic tasks and disruptions due to knee, upper back, and shoulder pain, which were most highly rated persistently over the previous twelve months. The results also showed that the primary reason why a patient sought medical attention was lower back pain, followed by problems with the knees and the shoulders. The study results suggest that cricketers suffer considerably from MSK health issues, and because of these issues, appropriate injury care and prevention are required. The musculoskeletal symptoms in club cricketers were most prevalent in the shoulder and lower back regions and least prevalent in the upper back.

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The following authors have made substantial contributions to the manuscript as under:

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Acquisition, Analysis or Interpretation of Data: Dr. Basma Areej (PT), Dr. Hirra Rafi (PT), Dr. Aeysha Bibi (PT), Dr. Haleema Sadia (PT), Dr. Anam Shabbir (PT), Dr. Sana Bashir (PT)

Manuscript Writing & Approval: Dr. Basma Areej (PT), Dr. Hirra Rafi (PT), Dr. Aeysha Bibi (PT), Dr. Haleema Sadia (PT), Dr. Anam Shabbir (PT), Dr. Sana Bashir (PT)

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CONFLICT OF INTEREST: The author (s) have no conflict of interest regarding any of the activity perform by PJR.

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ETHICS STATEMENTS: The protocol of the present study was registered by the local ethics committee of _Foundation University School of Health Sciences/Hospital: No. FF/FUMC/215-219/PHY/22_ approval code.

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