

# Exploring Musculoskeletal Symptoms in Adolescent Athletes and Non-Athletes: A cross-sectional study

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## ABSTRACT

**Objective:** To investigate and compare the prevalence and impact of musculoskeletal symptoms in adolescent athletes and non-athletes. The results might help to improve preventive measures and rehabilitation strategies that foster musculoskeletal health in both populations, evaluate potential gender differences.

**Study Design:** A cross-sectional study.

**Place and Duration of Study:** This study was conducted at the department of Orthopedic KTH Peshawar from January 2021 to January 2022.

**Methods:** A total of 750 adolescent athletes mean age:  $16.14 \pm 01.26$  and 337 non-athlete controls mean age:  $12.58 \pm 01.32$  were recruited for this study. Anthropometric information was taken and was examined for musculoskeletal symptoms developed over the 8-month duration using Teen Nordic Musculoskeletal Screening Questionnaire TNMQ-S. The assessment of symptoms and the level of control of school absenteeism and physical activity was compared in the two groups.

**Results:** More non-athlete controls reported a percentage of symptoms development in the neck n-341 (45.2%) vs. 186(24.8%) upper back 315 (42.2%) vs. 150(20.8%) and low back 322(43.2%) vs. 261(34.8%) B. These regions have shown a higher rate of school absenteeism and physical exercises on the impact in the non-athlete group. C. There was a more significant development of shoulder 277(37.1%) vs. 202(27.2%) and wrist/hand 178(23.8%) vs. 114(15.2%) symptoms among non-athletes, while it was more common in the elbow 69(9.2%) vs. 76(10.2%) group).

**Conclusion:** This study highlights disparities in musculoskeletal symptom prevalence and their impact on school attendance and physical activity between adolescent athletes and non-athletes. Non-athlete controls exhibited higher symptom prevalence, particularly in the neck, upper back, and low back regions, emphasizing the need for targeted preventive and rehabilitative interventions in this population.

**Key Words:** adolescent, musculoskeletal symptoms, athletes, non-athletes.

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## INTRODUCTION

More on musculoskeletal concerns amid teens, which embrace an array of conditions associated with the bones, joints and muscles, are a major public health problem worldwide (Cooper et al., 2020)<sup>1</sup>. Adolescent athletes and non-athletes alike are susceptible to musculoskeletal disorders, which could seriously damage their overall health and hamper their daily activities (Straccioli et al., 2019)<sup>2</sup>.

Tangible prevalence data of muscle and pain patterns among both groups is vital so as to formulate appropriate preventive measures and rehabilitation regimens custom-tailored for each category (Caine et al., 2015)<sup>3</sup>. In recent years we have seen a growing concern for differences between the 2 groups in terms of musculoskeletal symptoms observed in teenagers, Getting this kind of anthropology crystalization is important. It requires further injection into post-ischemic cytoprotection how English is learned worldwide; A number of test tubes of typical autographs all here prerequisites such guaranteed. Sports shoulder pain in adolescents is on the rise in popularity Throughout the course is intended to suit students of all levels. However, this kind of test is unconsummable, even though both youngsters diversified their educational backgrounds by taking part in sports activities, In this way, students with specific needs-could receive scholarships that would cover taking action on their lives for the summer. The water was drained from the canal by means of big pumps, while small basins held back rough, rising edge. In the

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same way, non-athletes may pay a price for their sedentary lifestyles, bad postures or simply too little exercise (Gravare et al., 2010)<sup>4</sup>. Although the existence of musculoskeletal problems among adolescents is gaining recognition, there is little research on the incidence and impact of such symptoms across different athletic groups (Emery et al., 2006)<sup>5</sup>. It is crucial to fill this research gap, if interventions to promote adolescent musculoskeletal health-will be guided by evidence (Micheli et al., 2016).<sup>6</sup> Furthermore, given differences in anatomy body composition and life styles it is possible that the gender issue also has a bearing on musculoskeletal pain patterns (Toombs et al., 2012)<sup>7</sup>. By looking at how many musculoskeletal symptoms the kids had and how this affected their school attendance and physical activity, we seek to add something new and important to the debate about adolescent health and sports injuries (Kolt et al., 2007)<sup>8</sup>. Such information will help us better target interventions aimed at reducing the burdens of musculoskeletal problems as well as optimizing health outcomes among all teenagers irrespective of athletic background (Micheli et al., 2011)<sup>9</sup>.

**METHODS**

A total of 750 adolescent athletes mean age: 16.14 ± 01.26 and 337 non-athlete controls mean age: 12.58 ± 01.32 were recruited for this study. Anthropometric information was taken and was examined for musculoskeletal symptoms developed over the 8-month duration using Teen Nordic Musculoskeletal Screening Questionnaire TNMQ-S. The assessment of symptoms and the level of control of school absenteeism and physical activity was compared in the two groups.

**Inclusion criteria:** teenagers are selected between 11-18 year old, subject to active athletes and non-athletes,

volunteering for this research, do not have serious diseases that would interfere with their daily life.

**Exclusion criteria:** the adolescent who has any known joint or skeletal disease and needs medical treatment, the student being rehabilitated after a musculoskeletal injury suffered in sports, those unable to give informed consent or finish the questionnaire, people with chronic diseases or disabilities that prevent them from participating actively in physical activities.

**Data collection:** Data collection included anthropometric measurement of both athlete and non-athlete adolescent participants. In addition, musculoskeletal symptoms over an 8-month period was collected using a Teen Nordic Musculoskeletal Screening Questionnaire. Participants were also characterized as the prevalence of symptom in nine anatomic regions was recorded for comparative analysis.

**Statistical analysis:** Statistical analysis was done spss 22.0 for summarized using descriptive statistics, including participants’ characteristics and prevalence of musculoskeletal symptoms. Comparative statistical analysis, including chi-square tests and t-tests, was used to compare between athlete and a non-athlete the aspects of symptoms prevalence, impact on school absence, and physical activity reduction. The significance was predetermined with p < 0.05.

**RESULTS**

The mean age was 16.14 ± 01.26 years with 49.2% n-369 (49.2) female age range of 25-35 years and male n-396(52.8%)age range of 40-65.n-52(7%) had a bad previous history. In the non-athlete group, a higher percentage of participants reported musculoskeletal symptoms in the neck (45.2% vs. 24.8%), upper back (42.2% vs. 20.8%), and low back (43.2% vs. 34.8%) compared to adolescent athletes.

**Table 1: Participant Demographics**

Variable	Mean Age	Gender (Female)	Gender (Male)	Age Range	Previous History (%)
All Participants	16.14 ± 01.26	49.2% (n=369)	52.8% (n=396)	25-35 (F), 40-65(M)	7% (n=52)
Athletes	12.58 ± 01.32	213	200	25-60	No
Non-athletes	12.44 ± 02.17	237	100	30-65	no

**Table No. 2: Musculoskeletal Symptoms Comparison Between Non-Athletes and Athletes**

Region	Non-Athletes (%)	Athletes (%)
Neck	45.2	24.8
Upper Back	42.2	20.8
Low Back	43.2	34.8
Shoulder	37.1	27.2
Wrist/Hand	23.8	15.2
Elbow	9.2	10.2

**Table No. 3: Impact of Musculoskeletal Symptoms on School Absenteeism and Physical Exercise**

Region	Non-Athletes Impact (%)	Athletes Impact (%)
Neck	High	Moderate
Upper Back	High	Moderate
Low Back	High	Moderate
Shoulder	Moderate	Moderate
Wrist/Hand	Moderate	Low
Elbow	Low	Low

These regions exhibited a greater impact on school absenteeism and physical exercise in the non-athlete group. Additionally, shoulder (37.1% vs. 27.2%) and wrist/hand (23.8% vs. 15.2%) symptoms were more prevalent among non-athletes, while elbow symptoms were slightly more common in athletes (9.2% vs. 10.2%).

## DISCUSSION

More recently, research has studied musculoskeletal symptoms amongst young athletes and non-athletes, respectively, data from which can be usefully compared with ours. A researcher discovered higher prevalence rates for musculoskeletal symptoms among non-athlete controls in contrast to their athlete counterparts. This is consistent with the findings of reports such as Stracciolini et al. (2019)<sup>10</sup> which showed that non-athletes had a higher rate of musculoskeletal injuries resulting from factors such as sedentary lifestyles and poor posture. However, some investigations such as that of DiFiori et al. (2014)<sup>11</sup> did produce higher feelings for musculoskeletal injuries in athletes due to the rigorous training conditions and participation in sports. The researcher brought out the significant impact of musculoskeletal symptoms on school absenteeism, physical exercise and paving a path for future research. This finding is consistent with studies like: Cooper et al. (2020)<sup>1</sup>: Musculoskeletal issues in the adolescent minor exerts a detrimental effect on adolescents daily functioning and quality of life. However, the impact of musculoskeletal symptoms on school absenteeism and physical exercise among athletes may vary based on the severity and specific type of injury, as noted in the studies of Jayanthi et al. (2015)<sup>12</sup> and Micheli & Mountjoy (2016)<sup>6</sup>. The researcher looked at possible differences between the sexes in musculoskeletal symptomatology but such an analysis was not the main focus of their paper. Earlier studies, such as Toombs et al. (2012)<sup>7</sup>, have shown that gender disparities in musculoskeletal injuries exist among adolescents: females tend to have higher rates of some sorts than males, for instance in the case of stress fractures. Further research is called for which would take a closer look at sex differences in musculoskeletal symptoms of adolescent athletes and non-athletes respectively. The findings of the researcher underlined the need for targeted preventive and rehabilitative strategies among non-athlete adolescents so as to promote good musculoskeletal health. This is consistent with reports such as Emery et al. (2015)<sup>5</sup> which recommend taking specific measures aimed at reducing the burden faced by young people from their musculoskeletal issues irrespective of whether they are athletes or not; and Micheli et al. (2011).<sup>9</sup> Interventions in this light could take various forms, including education programmes demonstrating sound training techniques, preventive measures designed to avert

injury, and early intervention strategies. Khattoon et al. (2022)<sup>10</sup> provided valuable insights into the prevalence and impact of musculoskeletal symptoms among adolescent athletes and non-athletes. While their findings are consistent with some previous research, further attention should be paid to gender differences in symptomatology and to developing targeted interventions in young people aimed at promoting musculoskeletal health. The purport of our study was to discern whether there are gender differences as regards the prevalence and impact of these symptoms among 750 adolescent athletes and 337 non-athlete controls. The examination was conducted utilising the Teen Nordic Musculoskeletal Screening Questionnaire (TNMQ-S) which detects musculoskeletal symptoms over a period lasting 8 months. Non-athlete controls had significantly higher prevalence rates of these symptoms, especially in neck, upper back and lower back regions. These symptoms had a significant effect on both physical exercise and school absenteeism among non-athletes. Nor did non-athletes see high rates with regards to the shoulder and wrist/hand and instead encountered more elbow symptoms than their athletic counterparts.

## CONCLUSION

The study highlights higher musculoskeletal symptom prevalence in non-athlete adolescents, notably in the neck, upper back, and low back regions, with significant impacts on school attendance and physical activity. Targeted interventions are essential to address these disparities and enhance musculoskeletal health among adolescents.

### Author's Contribution:

Concept & Design of Study:	Shehla Khattoon
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Final Approval of version:	Shehla Khattoon

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