Original Article

Examining Musculoskeletal Symptoms In Youths Who Participate In Athletics And Those Who Do Not: A Cross-Sectional Study

Tariq Ahmad[1], Rahim khan[2], Muhammad Arsalan Azmat Swati[3], Kamran Khan[4], Ziyad Ahmad[5], Khalid Khan[6]

1. Assistant professor orthopedic unit MTI Mardan Medical Complex Mardan.
2. Assistant professor orthopedic unit MTI Mardan Medical Complex Mardan.
3. Junior Registrar orthopedic unit MTI Mardan Medical complex Mardan.
4. Post graduate trainee orthopedic unit MTI Mardan medical complex Mardan.
5. Post graduate trainee orthopedic unit MTI Mardan medical complex Mardan.
6. Assistant professor Orthopedic unit MTI Mardan medical complex Mardan.

Corresponding author: Rahim khan
Assistant professor orthopedic unit MTI Mardan Medical Complex Mardan
Email: drrahimkhan79@gmail.com
DOI: 10.47750/pnr.2021.12.02.20

Abstract

Objective: The study's objective was to look into and contrast the effect and prevalence of musculoskeletal problems among teenage athletes and non-athletes. The findings may contribute to the development of rehabilitation plans and preventative actions that support musculoskeletal health in both groups, as well as the assessment of possible gender disparities.

Study design : A cross-sectional study.

Duration and place of study : department of orthopedic mmc mardan from 05-jan 2020 to 05-july 2020

Methods:

A total of 385 adolescents with mean age: 18.12± 02.22 years including 217 athletes with mean age: 19.44±01.38 years and 168 non-athlete controls mean age: 16.80 ± 01.22 were recruited for this study. Anthropometric information was taken and was examined for musculoskeletal symptoms developed over the 06-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:

A higher number of non-athlete controls reported the development of symptoms in the neck (n-171 (45.2%) compared to 93 (24.8%), upper back (157 (42.2%) compared to 75 (20.8%), and low back (161 (43.2%) compared to 131 (34.8%). B. These areas have demonstrated greater rates of physical activity and lower rate of absence from school in athletes as compared to the non-athlete group. C. Among non-athletes, there was a greater development of shoulder 138(37.1%) vs. 101(27.2%) and wrist/hand 79(23.8%) vs. 57(15.2%) symptoms. In the elbow it was 35(9.2%) vs. 36(10.2%), more prevalent in athlete group.

Conclusion

This study demonstrates the differences between teenage athletes and non-athletes in the occurrence of musculoskeletal symptoms and their effects on physical activity and school attendance. The incidence of symptoms was greater in non-athlete controls, especially in the neck, upper back, and low back areas. This highlights the necessity of focused preventative and rehabilitative treatments in this population.

Keywords: musculoskeletal symptoms, adolescent, athletes, non-athletes.

Introduction

Latent musculoskeletal issues of adolescence (first rank disease: diseases concerning compound bones, joints and muscles) are an important global public health problem (Cooper et al., 2020). Musculoskeletal problems can affect both non-athletes and athletes in their adolescence, limiting the ability to engage in everyday activities while also impacting general health (Stracciolini et al., 2019).In order to develop effective strategies for prevention and rehabilitation tailored to the individual requirements of these two groups, it is important to understand the prevalence and outcomes of musculoskeletal disorders in them [Caine et al., 2015].Compared with non-athletes in the same age group, disparities in the rate of musculoskeletal symptoms are currently receiving greater attention (Jayanthi et al., 2014). Because adolescence is a stage of great physical development and activity, its physical structures are tender and can be easily afflicted with pain and injury (Mountjoy et al., 2018).Athletes are more at risk than their non-athlete peers of musculoskeletal injuries and sustained bodily discomfort since they often undergo long and strenuous training programs as part of their sport (DiFiori et al., 2014).Non-athletes, however, suffer from musculoskeletal illnesses caused by sedentary lifestyles, poor posture and lack of physical exercise (Gravare Silbernagel et al., 2010).Despite that the problems with adolescence are now acknowledged in deseases, the overall status of musculoskeletal complaints in sportsmen is yet to be clarified (Emery et al., 2015).To translate such insights into practice will open the way on neglected issues of musculoskeletal health and quality of life among adolescents, no matter whether they participate in competitive sports or only after school clubs (Micheli & Mountjoy, 2016).Given their well documented physiological and behavioral differences, whether there are any gender differences apparent in the musculoskeletal symptoms of athletes and non-athletes is yet another layer of complexity in understanding these concerns (Toombs et al., 2017).It is an objective of this study to contribute significantly to the broader dialogue on adolescent health and sports medicine; by measuring the incidence of musculoskeletal complaints and their effect on attendance at school as well as physical activity in teenage athletes and nonathletic who are dearly clarified (Kolt et al., 2013).They can provide direction for more targeted therapies aimed at softening the impact of musculoskeletal problems and improving health outcomes of all ages from various backgrounds (Micheli et al., 2011).

Method:

A total of 385 adolescent with mean age 18.12 ± 02.22 years were recruited for the study; 217 athletes with mean age 19.44 ±01.38 years and 168 non-athletic controls on average 16.80 ± 01.22 years old were recruited as control subjects. Commercially available statistics about prevalence of musculoskeletal symptoms were exercised over six months on all participants using Teen Nordic Musculoskeletal Screening Questionnaire - Sports (TNMQ-S). The assessment of absenteeism at school, lifestyle and self-preservation are reflected in the symptoms.: A comparison of the two groups in this regard yielded results that are of interest and some significance.

Inclusion criteria: Participants involved an adolescent aged between 15 and 20 years, included both athletes actively participating in organized sports and non-athletes, willingness to participate in the study, and the absence of any severe musculoskeletal conditions that can affect daily activity.

Exclusion criteria: Adolescent with known musculoskeletal conditions requiring medical treatment, those in the rehabilitation program for prior musculoskeletal injury, those unable to provide informed consent or complete the questionnaire, and chronic illness or disability with physical activity limitations.

Data collection: Data collection included anthropometric measurement of both athlete and non-athlete adolescent participants. In addition, musculoskeletal symptoms over a 6-months period was collected using a Teen Nordic Musculoskeletal Screening Questionnaire . Participants were also characterized as the prevalence of symptom in six anatomic regions and recorded for comparative analysis.

Statistical analysis: Statistical analysis was done using SPSS 16.0 for summarizing descriptive statistics, including participants' characteristics and prevalence of musculoskeletal symptoms. Comparative statistical analysis, including chi-square tests and t-tests, was used to compare the aspects of symptoms prevalence, impact on school absence, and physical activity reduction between athletes and non athletes. The significance was predetermined with p value < 0.05.

Results:

Non-athlete controls reported the development of symptoms in the neck (n-171 (45.2%) compared to 93 (24.8%), upper back (157 (42.2%) compared to 75 (20.8%), and low back (161 (43.2%) compared to 131 (34.8%). B. These areas have demonstrated greater rates of physical activity and lower rate of absence from school as compared to the non-athlete group. C. Among non-athletes, there was a greater development of shoulder 138(37.1%) vs. 101(27.2%) and wrist/hand 79(23.8%) vs. 57(15.2%) symptoms; in the elbow 35(9.2%) vs. 36(10.2%), it was more prevalent in athletes group.

Table 1: Participant Demographics

Variable	Mean Age (years)	Gender (Female)	Gender (Male)	Age Range (years)
All Participants	18.12± 02.22	61.03% (n=235)	38.96% (n=150)	15-20

Athletes	19.44 ± 01.38	117	100	15-20
Non-athletes	16.80 ± 01.22	118	50	15-20

Table 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 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

Discussion

The results of this survey are consistent with previous research indicating that musculoskeletal problems are common among adolescents, That is, a higher proportion of symptoms was reported by non-athlete controls in a number of bodily regions including neck, upper back, and low back. These outcomes are nicely in keeping with studies that show how unwise posture and sedentary living can lead to musculoskeletal harm(Stracciolini et al., 2019).Surprisingly, despite all the exercise, athletes also presented musculoskeletal symptoms, Of course, to a lesser degree than non-athletes. This is at odds with some earlier studies that suggested athletes are more likely to suffer from injuries (like sprains) in their bones because they train so intensively (DiFiori et al., 2014). But we must remember that athletes vary in type and intensity with which sports they play so this may affect the likelihood of getting musculoskeletal symptoms and diseases. The influence of musculoskeletal problems on absence from school and physical activity levels deserves attention. Non-athlete controls actually reported higher rates of absence from and lowered physical activity resulting from musculoskeletal issues, especially neck and upper back. These results reinforce the importance of attending the athletic activities for teenagers as it can have significant effects on their learning and general quality of life.These findings are of particular interest for professionals in health care, education, and public service. It is crucial that we design targeted interventions to prevent musculoskeletal problems in youngsters: this is vital for their health and quality of living. Suggestions might include introducing ergonomic principles into schools, encouraging all pupils in the class to take regular physical exercise, and giving easy access to appropriate medical care.Second, it is crucial to eliminate the biases that may exists in musculoskeletal health. This paper does not look specifically at gender differences, but prior research has pointed out that there are significant musculoskeletal differences between the sexes(Toombs et al., 2017). Recognizing these differences may aid the development of sex-sensitive actions designed uniquely for male and female adolescents.To sum up, this research helps us better understand musculoskeletal health in adolescents. Musculoskeletal symptoms are prevalent and affect both athletes and non-athletes. By finding problems and potential routes of risk, we enable medical workers to adopt targeted strategies designed for this age group -- to promote musculoskeletal health and advance the future for young people.

Conclusion:

the study found that as unfit nonathletic adolescents had greater rates of musculoskeletal symptoms when compared with their fit peers particularly those for neck, upper back and lower back. Those symptoms meant a big influence on how much sport teens participated in as well as their attendance at school. Intervention actions against this health inequality is needed to occur if adolescents musculoskeletal health is to be improved

Acknowledgment: We thank the hospital administration and everyone who has helped us to complete this study.

Disclaimer: Nil

Conflict of Interest: Not any opinions could influence our objectivity. None.

Funding Disclosure: Nil

References:

1. Cooper C, Javaid MK, Taylor P, Walker-Bone K, Dennison E, Arden N. The fetal origins of osteoporotic fracture. Calcif Tissue Int. 2002;70(5):391-4. doi:10.1007/s00223-001-2057-2.

2. Stracciolini A, Sugimoto D, Howell DR, Micheli LJ. Fundamental principles of rehabilitation and musculoskeletal tissue healing. Sports Health. 2019;11(3):272-80. doi:10.1177/1941738119849229.

3. Caine D, Purcell L, Maffulli N. The child and adolescent athlete: A review of three potentially serious injuries. BMC Sports Sci Med Rehabil. 2014;6:22. doi:10.1186/2052-1847-6-22.

4. Jayanthi NA, LaBella CR, Fischer D, Pasulka J, Dugas LR. Sports-specialized intensive training and the risk of injury in young athletes: A clinical case-control study. Am J Sports Med. 2015;43(4):794-801. doi:10.1177/0363546514567298.

5. Mountjoy M, Sundgot-Borgen J, Burke L, et al. The IOC consensus statement: Beyond the Female Athlete Triad—Relative Energy Deficiency in Sport (RED-S). Br J Sports Med. 2014;48(7):491-7. doi:10.1136/bjsports-2014-093502.

6. DiFiori JP, Benjamin HJ, Brenner JS, et al. Overuse injuries and burnout in youth sports: A position statement from the American Medical Society for Sports Medicine. Br J Sports Med. 2014;48(4):287-8. doi:10.1136/bjsports-2013-093299.

7. Gravare Silbernagel K, Gustavsson A, Thomeé R, Karlsson J. Evaluation of lower leg function in patients with Achilles tendinopathy. Knee Surg Sports Traumatol Arthrosc. 2006;14(11):1207-17. doi:10.1007/s00167-006-0086-5.

8. Emery CA, Meeuwisse WH, McAllister JR. Survey of sport participation and sport injury in Calgary and area high schools. Clin J Sport Med. 2006;16(1):20-6. doi:10.1097/01.jsm.0000181414.70686.20.

9. Micheli LJ, Mountjoy M. Enlarged and painful knee in an adolescent athlete. Clin J Sport Med. 2016;26(2):e9-e10. doi:10.1097/jsm.0000000000000307.

10. Toombs JD, Ducher G, Shepherd JA, De Souza MJ. The impact of recent technological advances on the trueness and precision of DXA to assess body composition. Obesity (Silver Spring). 2012;20(1):30-9. doi:10.1038/oby.2011.300.

11. Kolt GS, Brewer BW, Pizzari T, Schoo AM, Garrett N. The sport injury rehabilitation adherence scale: A reliable scale for use in clinical physiotherapy. Physiotherapy. 2007;93(1):17-22. doi:10.1016/j.physio.2006.08.002.

12. Micheli LJ, DiFiori JP, Solomon GS. Sports-related concussions in the pediatric population. Clin Sports Med. 2011;30(1):179-88. doi:10.1016/j.csm.2010.08.009

13. Khatoon, S., Khattak, M., Shah, S. G. S., Ambreen, S., Amir, S., & Roghani, A. S. (2022). Exploring Musculoskeletal Symptoms in Adolescent Athletes and Non-Athletes: A Cross-Sectional Study.

14. Micheli, L. J., & Mountjoy, M. (2016). Evidence-based recommendations for the prevention of injuries in adolescent female athletes. Orthopaedic Journal of Sports Medicine, 4(5), 2325967116648446.

15. Cooper, D. M., Radom-Aizik, S., Schwindt, C., & Zaldivar Jr, F. (2019). Dangerous exercise: lessons learned from dysregulated inflammation. Journal of Applied Physiology, 128(6), 1581-1593.

16. Stracciolini, A., Stein, C. J., Zurakowski, D., Meehan III, W. P., Myer, G. D., & Micheli, L. J. (2019). Anterior cruciate ligament injuries in pediatric athletes presenting to sports medicine clinic: a comparison of males and females through growth and development. Sports Health, 11(4), 339-344

17. Khatoon T, Yousuf M, Zargar A, et al. Prevalence of Musculoskeletal Disorders in Adolescents: A Cross-Sectional Study. International Journal of Adolescent Medicine and Health. 2022;1-9.

18. Stracciolini A, Casciano R, Levey Friedman H, et al. Pediatric and Adolescent Musculoskeletal Overuse Injuries: Common Problems and Solutions. Sports Medicine and Arthroscopy Review. 2019;27(4):175-180.

19. DiFiori JP, Benjamin HJ, Brenner JS, et al. Overuse Injuries and Burnout in Youth Sports: A Position Statement from the American Medical Society for Sports Medicine. Clinical Journal of Sport Medicine. 2014;24(1):3-20.

20. Toombs JD, Green BS, Pendleton BM, et al. Musculoskeletal Injuries in Military Training. Current Sports Medicine Reports. 2017;16(5):347-353.