

# Adolescent Volleyball is slightly protective for low back pain and not correlated with spinal deformities : a controlled cross-sectional survey

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## 1 Introduction

A long discussion exists about the possible influence of sport activities on spinal growth and low back pain (LBP) in adolescence, but, with some exception, data are missing.

Volleyball is widely practiced by girls in many countries, but we don't know if there is any correlation with spinal deformities and LBP.

*AIM:* Verify prevalence of postural changes, spinal deformities and LBP in girls playing agonistic volleyball compared to normal controls.

## 2 Methods

We evaluated 99 girls practicing agonistic volleyball 2-3 times per week in the age range 11-14, and compared them to a normal sample of 91 schoolgirls of the same age range.

We proposed a validated questionnaire to collect data on LBP.

We collected a series of already validated measurements:

- plumbline distances from kyphosis apex of the C7 and L3 vertebrae

- ATR (Angle of Trunk Rotation) according to Bunnell. According to previous studies, we considered these normal references:

- ATR: 5°
- C7: 15-55 mm
- L3: 28-70 mm

*Statistics:* ANOVA; chi-square test, with Yates' correction for 2-by-2; Kruskal Wallis test.

## 3 Results

Compared to normals, volleyball players had the same lifetime prevalence (49.5%), but there were some differences considering one single episode of pain, that was more frequently observed in the volley group, and repeated episodes, more frequently seen in normals ( $p < 0.10$ ; Fig 1). This trend toward significance didn't change even pooling together those who never had LBP and those who had it only once (Fig 2).

Volleyball players had a slightly reduced point prevalence (9% vs 19%) and prevalence in the previous 15 days (33% vs 57%,  $p < 0.05$ , Fig 1). No differences were noted for medical examinations and X-rays.

We did not find more pathological cases in Volleyball players than in controls for the considered parameters:

- ATR:  $3.5^\circ \pm 1.7$  (volleyball) vs  $3.1^\circ \pm 1.5$  (control; Fig 3)
- C7:  $21.6 \pm 9.0$  vs  $20.5 \pm 13.0$
- L3:  $46.0 \pm 11.0$  vs  $44.0 \pm 14.0$ .

## 4 Discussion

Agonistic volleyball players have suffered less LBP than controls in the last 15 days, even if the lifetime prevalence is the same. Some small differences were seen for single LBP episodes that were more frequent in volleyball players and for repeated episodes, more frequent in normal subject. So we can assume Volleyball to be a moderate protective factor for LBP.

Volleyball adolescent players have a the same asymmetries without clinically significant differences between groups.

This study has some limits: the use of a questionnaire to assess LBP can reduce the reliability of the study. On the contrary, this tool being the same for the two population of the study allowed a reliable comparison. Moreover, the population studied allowed to draw interesting results, but a larger population could be useful for more precise subgroup analysis.

## 5 Conclusion

According to our data we can assume Volleyball to be a safe Sport during adolescence both for back pain and for spinal deformities.

Fig 1: Low Back Pain Lifetime Prevalence.  
A: no episodes; B: one episode; C: some episodes. D: Recurrent episodes.

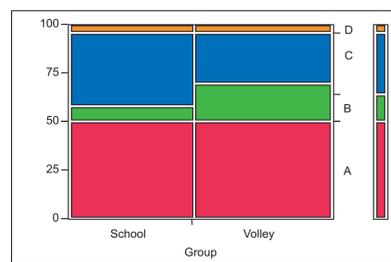


Fig 2: LBP prevalence in the previous 15 days.  
The difference was statistically significant.

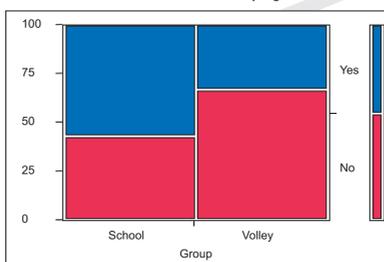
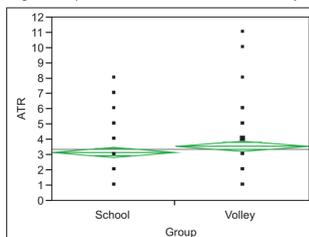


Fig 3: The prevalence of LBP in the last 15 days.



Angle of Trunk rotation in the 2 groups.  
There were no statistically significant differences.

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