

## Scoliosis in adolescence: screening in schools in southern Portugal

Beatriz Minghelli<sup>1,2</sup>, Ana Carolina Coelho<sup>1</sup>, João Maximino<sup>1</sup>, Alexandre Duarte<sup>1</sup>, Ana Carolina Guerreiro<sup>1</sup>, Bruno Marques<sup>1</sup>, Inês Costa<sup>1</sup>, João Belo<sup>1</sup>, Pedro Mourato<sup>1</sup>

<sup>1</sup>School of Health Jean Piaget Algarve – Piaget Institute – Portugal

<sup>2</sup>Research in Education and Community Intervention (RECI); beatriz.minghelli@silves.ipiaget.pt

### ABSTRACT

**BACKGROUND:** Scoliosis is a lateral curve on the spine in the frontal plane at an angle greater than 10° on the radiograph obtained by Cobb's method and may be accompanied by vertebral rotation, deformity in the sagittal plane and ribs<sup>[1,2]</sup>. **OBJECTIVES:** This study aimed to determine the prevalence of scoliosis in adolescents. **METHODS:** The sample was constituted by 205 adolescents, ages 12 to 17 years old (14.67±1.51), being 106 (51.7%) boys and 99 (48.3%) girls, enrolled in 8th and 10th years of schools in Portimão city, southern Portugal. The instrument of measurement consisted of a scoliometer. To perform the evaluation, the adolescents remained in flexion of the spine, and, in this position, the evaluator positioned the scoliometer perpendicular to the evaluated vertebral zones which were the mid-thoracic (T4-T8), thoracolumbar (T12-L1) and lumbar (L2-L5)<sup>[3]</sup>. The side of the hump determined laterality of trunk rotation. Students that showed a trunk rotation between 5° to 6° degrees were classified with intermediate asymmetry (corresponding to an angle of 10° in Cobb's method) and the values equal to or greater than 7° corresponded to the presence of scoliosis of severe asymmetry (angle of 30° in Cobb's method)<sup>[4]</sup>. Several studies have found a good inter and intra-rater reliability of the scoliometer and are reporting/reported a sensitivity of 90.6% and a specificity of 79.8%<sup>5</sup>. **RESULTS:** Scoliosis was present in 10 (4.9%) adolescents, being 5 (2.4%) classified as intermediate asymmetry and 5 (2.4%) as severe asymmetry. Values of minimum, maximum, mean and standard deviation in mid-thoracic, thoracolumbar and lumbar spine regions were, respectively: 0-7, 1.42±1.26; 0-10, 1.46±1.31; 0-15, 1.68±1.86. Regarding the side of the curve, in mid-thoracic zone 97 (47.3%) were on right and 47 (22.9%) on left side, in thoracolumbar 89 (43.4%) were on right and 68 (33.2%) on left, and in lumbar zone, 94 (45.9%) on right side and 53 (25.9%) on left side. Boys had 3.96 more chances to have scoliosis (95% CI: 0.82-19.12; p=0.087) compared with girls, and younger students (12-14 years old) present 1.68 more probability to have an injury (95% CI: 0.46-6.14; p=0.433) than the older one (15-17 years old), but these associations did not reach statistical significance. **CONCLUSIONS:** Data showed a lower prevalence of scoliosis in this adolescent sample, in agreement with results of other studies. Despite this result, it is important to perform these screenings because it allows detecting mild and reversible spinal curvatures and treating them conservatively.

**Keywords:** scoliosis, school age, spine

## References:

- [1] Asher MA, Burton DC. Adolescent idiopathic scoliosis: natural history and long term treatment effects. *Scoliosis*. 2006; 1(1): 2
- [2] Bunnell WP. Selective screening for scoliosis. *Clinical Orthop Relat Res*. 2005; (434): 40-45
- [3] Grivas TB, Vasiliadis ES, Mihas C, Triantafyllopoulos G, Kaspiris A. Trunk asymmetry in juveniles. *Scoliosis*. 2008; 3: 13
- [4] Bunnell WP. An objective criterion for scoliosis screening. *J Bone Joint Surg Am*. 1984; 66(9): 1381-1387
- [5] Amendt LE, Ause-Ellias KL, Eybers JL, Wadsworth CT, Nielsen DH, Weinstein SL. Validity and reliability testing of the Scoliometer. *Phys Ther*. 1990; 70(2): 108-117

**Funding Sources:** This study is financed by national funds through FCT - Foundation for Science and Technology, I.P., in the scope of the project UID/Multi/04587/2019.