

Reviewer number 02444787

*Well-prepared article. But what are the limitations of this study? It should be added in the discussion part.*

Author's response to comments from reviewer number 02444787

Thank you for the positive comments. We have now amended the discussion to give more detailed information addressing of the limitations of the study. The text was added:

This study has its strengths and weaknesses one must consider when interpreting results. A methodological strength of the study was that two physiotherapists performed measurements in 3 anatomical planes for all subjects using the same Baseline® Body Level/Scoliosis meter with no knowledge of results between examiners. The therapists received 5 hours training, and were considered proficient with application of the tool. Although there is no recommendation in the literature regarding the training time necessary, previous studies have trained up to 10 hours of which the authors suggested contributed to the good to excellent reliability within the study<sup>[16]</sup>. The study method aimed to control potential variance in measures caused by fatigue from repeated measures by providing rest periods between measurements. Similarly the study method aimed to control variance due to patient flexibility, body mass index (BMI) or previous activity by re-testing within the same session. The methods lacked however intra-rater reliability measures for sagittal and frontal plan measures which could have provided more thorough information on reliability of the Baseline® Body Level/Scoliosis meter. With regards to sample representativeness it can be considered a strength that our patient sample is consecutively recruited, has a female to male 6.8:1 ratio and main thoracic (1AN) to thoracolumbar/lumbar (5CN) 2:1 curve type ratio representative of the current prevalence of AIS in the population for a mean curvature of 20-30°<sup>[27]</sup>. A possible limitation however is our sample size was not powered for gender or curve type subgroup analysis<sup>[27]</sup>. The size of our recruited sample was however adequate to establish group level clinically important change values and the sample was well above the minimum suggested sample size of 15-20 patients for reliability studies with continuous data<sup>[11]</sup>.

Reviewer number 02444729

*The authors of this observational reliability and concurrent validity study investigate the reliability and concurrent validity of the Baseline Body Level/Scoliosis meter for AIS postural assessment in three anatomical planes. A total of 31 pts with AIS with curvatures ( $25 \pm 12^\circ$ ). Measurement of cervical, thoracic and lumbar curvatures, pelvic and shoulder tilt, and axial thoracic rotation (ATR) were performed by two trained physiotherapists in one day. There was excellent reliability between examiners for thoracic kyphosis (ICC2,1 0.94) and ATR (ICC2,1 0.92), however poor agreement for pelvic and shoulder tilt. Both devices were reproducible in the measurement of ATR when repeated by one examiner (ICC3,3 0.98-1.00). The device had a good correlation with the Scoliometer ( $\rho = 0.78$ ). When compared with Cobb angle from radiographs, there was a moderate correlation for ATR ( $\rho = 0.627$ ). And the authors concluded that the Baseline Body Level/Scoliosis meter provides reliable transverse and sagittal thoracic and lumbar measurements and valid transverse plan measurements of mild-moderate scoliosis deformity. This is a well performed study with sound statistics and clear reliability tests. This a non-invasive method for evaluations frontal and sagittal curvatures in mild AIS individuals. I think that this device is an armature in the hands of nurses and even physicians to measure with great accuracy and follow patients with AIS, avoiding unnecessary irradiation. The only limitation I see is the small number of individuals recruited for this study.*

#### Author's response to comments from reviewer number 02444729

Thank you for the positive comments. We have now amended the discussion to give more detailed information regarding sample size of the study. The following text was added:

**The size of our recruited sample was however adequate to establish group level clinically important change values and the sample was well above the minimum suggested sample size of 15-20 patients for reliability studies with continuous data<sup>[11]</sup>.**

#### Reviewer number 02452864

*This study was a prospective study of 31 patients diagnosed with adolescent idiopathic scoliosis. The object was to determine inter-examiner reliability of a device, the Baseline Body Level/Scoliosis meter, in measurements of scoliosis in the three-dimensional anatomic plane. The study also compared the reliability between this device and other devices/methods including a traditional scoliometer and radiographic Cobb angles. The findings of this study indicate that there is good to excellent reliability for this device in measurements of thoracic kyphosis, axial thoracic rotation, and lumbar lordosis. There was varying adequacy in the measurements of cervical lordosis, and poor*

*accuracy in the measurement of secondary curves in the frontal plane, pelvic tilt, and shoulder tilt. The tested device had similar reliability to the scoliometer and moderate reliability to the radiographic Cobb angle. The final conclusion was that this device provides reliable transverse and sagittal thoracic and lumbar measurements, along with valid transverse plane measurements, in mild to moderate scoliosis deformity. Strengths ? Prospective Study ? Exhaustive testing of multiple angles ? Good study design involving two examiners of equal experience, good definition of measurement protocols, and multiple trials per measurement Weaknesses ? Small sample size ? Large female over-representation in the sample ? No clear explanation of why this is better than the scoliometer if the reliability is similar ? No clear explanation of why this is better than the scoliometer or using Cobb angles if this device is only reliable in mild to moderate cases of scoliosis Comments ? General English language editing ? Tables require re-formatting ? No figure legend for the Figure 1*

Author's response to comments from reviewer number 02452864

Thank you for the positive comments. We have now amended the manuscript in line with the editors formatting feedback, performed another general English assessment, discussed the strengths and weaknesses of the study and identified the benefits of the Baseline Body Level/Scoliosis meter over the Scoliometer and Radiological Cobb angle. The following text was added: This study has its strengths and weaknesses one must consider when interpreting results. A methodological strength of the study was that two physiotherapists performed measurements in 3 anatomical planes for all subjects using the same Baseline® Body Level/Scoliosis meter with no knowledge of results between examiners. The therapists received 5 hours training, and were considered proficient with application of the tool. Although there is no recommendation in the literature regarding the training time necessary, previous studies have trained up to 10 hours of which the authors suggested contributed to the good to excellent reliability within the study<sup>[16]</sup>. The study method aimed to control potential variance in measures caused by fatigue from repeated measures by providing rest periods between measurements. Similarly the study method aimed to control variance due to patient flexibility, body mass index (BMI) or previous activity by re-testing within the same session. The methods lacked however intra-rater reliability measures for sagittal and frontal plan measures which could have provided more thorough information on reliability of the Baseline® Body Level/Scoliosis meter

With regards to sample representativeness it can be considered a strength that our patient sample is consecutively recruited, has a female to male 6.8:1 ratio and main thoracic (1AN) to thoracolumbar/lumbar (5CN) 2:1 curve type ratio representative of the current prevalence of AIS in the population for a mean curvature of 20-30°<sup>[27]</sup>. A possible limitation however is our sample size was not powered for gender or curve type subgroup analysis<sup>[27]</sup>. The size of our recruited sample was however adequate to establish group level clinically important change values and the sample was well above the minimum suggested sample size of 15-20 patients for reliability studies with continuous data<sup>[11]</sup>.

Despite the discussed strengths and weaknesses of the study, the benefits of the Baseline® Body Level/Scoliosis meter outweigh the use of the Scoliometer and Cobb angle for initial screening of mild-moderate scoliosis. This mainly due to it providing reliable, valid, feasible and acceptable measures in several anatomical planes aiding decision making regarding the need for radiographic exposure and potential interventions to prevent AIS progression and dysfunction.