

Heavy Schoolbags do not Contribute to Scholarship but Curvatures of the Spinal Column

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The original meaning of ‘orthopedics’ is straight (ortho) child (pedics), making scoliosis case finding a task of utmost importance. Scoliosis is defined as lateral curvatures and rotations of the spinal column. According to ICP (Infancy-Childhood-Puberty) model of Karlberg, there are three periods of rapid growth, the first one just after conception for the first 2-3 months, the second one just after entering the childhood phase, after the release of growth hormone, around the age of 3 to 4 years and the third one just after entering puberty phase, after the release of sex hormone, around the age of 11-13 years. As shown in Fig. 1, scoliosis, which starts during the first phase, is termed as ‘infantile scoliosis’ (conception/birth to 3 years), if the disease appears during the second phase, it is classified as ‘juvenile scoliosis’, whereas the one showing up during the third phase is recognized as ‘idiopathic scoliosis’. The last one is of utmost concern to orthopedic surgeons. The authors have proposed different indicators to assess risk of acquiring scoliosis, namely CSRW (Cumulative-Scoliosis-Risk Weightage) and NSRW (Normalized-Scoliosis-Risk Weightage) as well as Differential-Spinal-Function Testing to rule out scoliosis-like conditions. They have advocated regular surveillance of backs of the school-going children using moiré-fringe topography, rasterstereography and dotted-rasterstereography, to classify these children as low risk, medium risk and high risk. Mathematical modeling of scoliotic spine was taken up by the corresponding author in a conference paper, followed by a journal paper, latest one published in 2019. Recently, Kurz and co-workers discussed geometry of scoliosis. One of the factors, which contribute towards development of spinal curvatures, is the heavy school bags worn improperly on one side (Fig. 2a), instead of being symmetrically worn properly on both sides, so that weight is supported on back instead of one shoulder (Fig. 2b, d). Even a bag too heavy, which is worn on both shoulders, would produce a kyphotic posture (Fig. 2c). According to a 2021 study Tahirbegolli and co-workers, 56.5% of the fourth grade students carry a schoolbag weighing over 12.5% of body weight; relatively high prevalence of idiopathic scoliosis was found in primary schools in Prishtina, Kosovo. The aim of the study was to assess the prevalence of scoliosis among child-

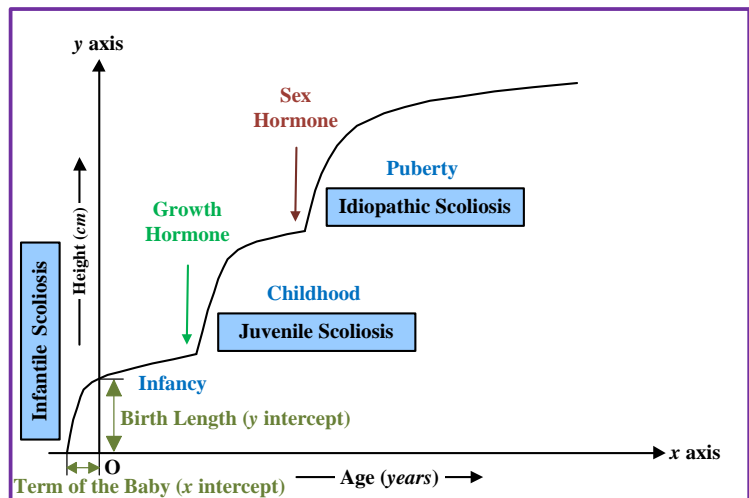


Fig. 1. The ICP model of child growth and presence of scoliosis in different age ranges; progression of scoliosis is related to periods of rapid growth — just after conception, start of childhood curve and start of puberty curve (around the age of 11-13 years; crucial in the surveillance for ‘idiopathic scoliosis’)



Fig. 2. (a) Incorrect and (b-d) correct ways of wearing schoolbag

ren aged 8-15-year-old and to identify the impact of schoolbag weight in developing adolescent idiopathic scoliosis. In an older paper, the corresponding author and his co-workers discussed physics of scoliosis screening. Table 1 of that paper gave a glimpse of how heavy school bags of children were — ratio (expressed as percentage) of weight of schoolbag to weight of child 19% (7.5- and 8.0-year-old), 22% (11.5-year-old) and 38% (5.5-year-old). According to a 2019 editorial, KP Government was putting forward a legislation to limit weight of schoolbag to 15% of weight of the child and in 2021 it was reduced to 10%. Trolley bags replacing strap bags are not practical for students, as they have to climb stairs in schools as well as walk from homes to schools using broken roads and pavements (Fig. 3). The solution lies in revolutionary thinking and action in the system of education in practice in primary and secondary schools. Rote learning and dumping of information, which require heavy books, workbooks as well as homework and classwork copies, is to be replaced by creative thinking, critical analysis and synthesis of ideas, which is the hallmark of education policy of the third millennium, producing leader-integrators of tomorrow. The following are recommended to eliminate the problem of heavy-asymmetrically-stuffed school bags:

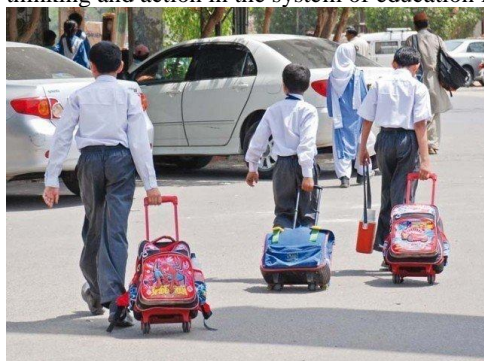


Fig. 3. Trolley bags replacing strap bags not practical for students

- Unnecessary books and copies should not be kept in school bags.
- Load in school bags should be symmetrically distributed on both sides.
- Bags with one strap should be banned on school premises (Fig. 2a); schoolbags to be worn on both shoulders (Fig. 2b-d).
- A short-term solution is to store excess books and copies in lockers.
- A long-term solution is to replace bulky schoolbags by a single monthly textbook (different sections for various subjects) cum workbook[§], keeping the contents updated in line with the rapid explosion of knowledge (updated weekly by CD/internet links[¶]) and enhancing students’ interest by introducing them to fresh material every month.