

Mechanical Advantages of the 'KZ Bag' on Spine and Posture of School Aged Children

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Abstract : Background and Purpose: The effects of backpack on 'school-age' children (Age 9-12) years, have been a critical subject of discussion throughout the past years. It has been one of the factors that contribute to a bad posture for 40% to 70% of developed countries. A child carrying a heavy backpack for a prolonged period, on a daily base has shown significant changes in the child's spinal posture, foot shape, and gait. The back pain caused by the compensatory posture, or "Backpack syndrome", is also known for its headaches, fatigue, cervical and lumbar pain caused by the abnormal body posture. The child tends to balance himself by bending forward to match the heavy backpack, moving his Centre of Gravity forward, resulting in decreased lumbar lordosis and increased thoracic kyphosis. Since currently available bags have not addressed the weight distribution issue till now. Therefore, KZ bag is believed to prevent the huge backward shift of COG due to the load, and hence all the symptoms accompanied. This is thought to be possible by combining the design of a normal backpack with a messenger bag. The purpose of this study is to investigate the improvement of the child's spine and to minimize the compensatory posture after using the KZ bag. Materials and Methods: KZ bag would compromise the pros of a messenger bag (keeping the COG in place) by a diagonal load strap and of a backpack (distributing the load on both shoulders) by connecting another load strap parallel to the sagittal plane of the body. The design would be made adjustable to match the child's height, and the bag load kept within limits, (10-15%) of the child's body weight. Measurements of Postural angles (Cervical, shoulders, and Trunk) would be taken after the use of KZ bag for a specified period. Conclusion: KZ bag will prove an improved distribution of weight of the bag on the child's body, and reduce the degree of the compensatory posture, that occurs in the attempt to balance the external weight of the bag.

Keywords : backpack, backpack syndrome, posture, spine

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