

**A cross-sectional study of young university students
exploring the associations between different methods of
bag carrying during adolescence and their current pain
experience, postural asymmetry and quality of life**

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Abstract

Introduction: previous studies have investigated the effects of load carrying on the human body, but to date, there is little information on the long-term consequences of load carrying during adolescence. The aim of this two-phase study was to determine whether there is any difference in pain experience, postural asymmetry and life quality in young university students with different past habits of bag carrying.

Methods: an Internet survey of university students aged 18 to 24 years was conducted to ascertain bag carrying habits during adolescence and adulthood as well as recent pain experiences and qualities of life. Respondents were also invited to participate in the second phase of the study. This involved video recording and computer analysis of postures to measure postural asymmetries in a sample of participants of the first phase.

Results: out of 6500 eligible students, 1224 responses were received (response rate = 20%). 79% reported carrying their bags asymmetrically during adolescence; 53% in adulthood. Pain during the preceding six months was reported by 42% of respondents: 23% low back pain; 20% neck pain; 18% shoulder pain. A statistically significant difference in pain experience was found between students who carried bags symmetrically (36%) and asymmetrically (44%) during adolescence (Chi-square test, $P = 0.03$, $n = 1117$). Students with asymmetrical bag carrying showed a lower quality of life in comparison with their symmetrical counterparts (Chi-square test, $p = 0.037$, $n = 1157$). Postural analysis did not show significant differences in postural asymmetries between the two groups.

Conclusion: results suggest that asymmetrical bag carrying during adolescence may be associated with a greater risk of developing musculoskeletal pain disorders and a lower quality of life in later years. However, the study did not find evidence for a relationship between bag carrying and postural asymmetry. The results of this study support the notion that advises students to carry school bags on both shoulders, especially during the critical period of adolescence.

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