

## THE IMPACT OF EXCESSIVE SCHOOL BACKPACK WEIGHT ON MUSCULOSKELETAL HEALTH AND ACADEMIC PERFORMANCE IN FIFTH-GRADE STUDENTS.

*Tashkent Medical Academy, Tashkent, Uzbekistan.*

*Ibrokhimova D.I., Abdukadirova L.K.*

**Abstract:** This study examines the correlation between school backpack weight and musculoskeletal health among fifth-grade students at School No. 312 in Tashkent. By measuring backpack weight, anthropometric data, and self-reported discomfort levels, the study identifies a significant prevalence of excessive loads exceeding recommended limits. The findings indicate that heavier backpacks contribute to back pain, postural deviations, and fatigue, potentially affecting students' academic performance. The study advocates for interventions such as ergonomic backpack design, lighter textbooks, and school-based strategies to reduce health risks.

**Keywords:** Backpack weight, musculoskeletal health, elementary students, ergonomic interventions, academic performance.

**The aim of study** was to investigate the impact of excessive school backpack weight on the health of fifth-grade students and to develop evidence-based recommendations for preventative interventions.

**Materials and methods.** The study was conducted in two phases:

**Phase 1:** Over a one-week period (Monday to Saturday), the total weight of each student's backpack, including textbooks, was measured daily. The number and percentage of students carrying excessive loads were recorded. Each student's backpack was weighed, and the data were systematically documented in a table.

**Phase 2:** Students' anthropometric measurements (height and weight) were assessed. Based on these measurements, the optimal and maximum recommended backpack weights were calculated following the World Health Organization's recommended standards, which suggest that a student's backpack should weigh no more than 10-15% of their body weight.

**Results.** The data shows that students carry the heaviest backpacks on **Monday (6.075 kg, 72.5% exceeding the limit)** and **Tuesday (5.585 kg, 47.5%)**, suggesting a heavier workload at the start of the week. **Wednesday and Friday** see a drop in excessive loads, while **Thursday** has the lightest backpacks, with no students exceeding the recommended weight.

On average, students should carry **3.755 kg (optimal)** or a **maximum of 5.59 kg**, yet many exceed this limit, increasing the risk of musculoskeletal issues. The findings

highlight the need for **lighter materials, better scheduling, and ergonomic backpacks** to reduce physical strain on students.

### Conclusion:

The results indicate that the majority of fifth-grade students carry backpacks exceeding the recommended weight limits, which may have adverse health effects. To address this issue, school administrators and educators should implement measures to optimize backpack loads. Strategies may include providing facilities for students to store textbooks at school, encouraging the use of lighter textbooks, and promoting ergonomically designed backpacks. Furthermore, awareness campaigns for students and their parents should be conducted to educate them about the importance of maintaining an appropriate backpack load.

### References.

1. Perrone M, Orr R, Hing W, Milne N, Pope R. The Impact of Backpack Loads on School Children: A Critical Narrative Review. *Int J Environ Res Public Health*. 2018 Nov 12;15(11):2529. doi: 10.3390/ijerph15112529. PMID: 30424517; PMCID: PMC6267109.
2. Mackenzie WG, Sampath JS, Kruse RW, Sheir-Neiss GJ. Backpacks in children. *Clin Orthop Relat Res*. 2003 Apr;(409):78-84. doi: 10.1097/01.blo.0000058884.03274.d9. PMID: 12671488.
3. Drzał-Grabiec J, Snela S, Rachwał M, Podgórska J, Rykała J. Effects of carrying a backpack in an asymmetrical manner on the asymmetries of the trunk and parameters defining lateral flexion of the spine. *Hum Factors*. 2015 Mar;57(2):218-26. doi: 10.1177/0018720814546531. Epub 2014 Aug 8. PMID: 25850153.