Research on the Appropriate Fit of Desk and Chairs in School-Age Children

Are the desks and chairs at school appropriate?
Saarni L, Nygård CH, Kaukiainen A, Rimpelä A.

The aim of the current study was to find out how the measures of chairs and desks match with the anthropometrics of schoolchildren and how schoolchildren sit during a lesson in their classroom. This paper reports the baseline measurements of an intervention study. Participants of this study were 6th and 8th grade (12 and 14 year old) schoolchildren from two comprehensive schools in Finland (N = 101, 57 girls and 44 boys). The main outcome measures were the differences between desk height and elbow-floor height, and chair height and popliteal height. Forty-three participants were randomized for sitting posture analysis by video recordings. The study showed that desks were on average 13 cm above elbow-floor height and chairs 2 cm below popliteal height. For 56% of time participants sat with their backs flexed >20 degrees and/or rotated >45 degrees. For 70% of time they sat with their necks flexed >20 degrees or rotated >45 degrees. The results indicate that there is a mismatch between school furniture and the anthropometrics of schoolchildren. Schoolchildren sit in disadvantaged postures for a substantial part of school lessons.

Classroom furniture dimensions and anthropometric measures in primary school.
Panagiotopoulou G, Christoulas K, Papanckolaou A, Mandroukas K.

The purpose of this study was to compare students’ dimensions to the dimension of school furniture, in primary school, and determine whether this type of furniture is well-designed and promotes good sitting posture at school by taking into account the dimensions of the children. A total of 180 (90 male and 90 female) students, from three primary schools in Thessaloniki, Greece, participated in the study. Their ages ranged from 7 to 12 years. The following human body dimensions were measured: stature, elbow height, shoulder height, upper arm length, knee height, popliteal height and buttock-popliteal length. In addition, the dimensions were measured for four different types of chairs and five types of desks prevalent in classrooms. Finally, the anthropometric measures of the students and the furniture dimensions were compared in order to identify any incompatibility between them. The data indicate a mismatch between the students’ bodily dimensions and the classroom furniture available to them. The chairs are too high and too deep and desks are also too high for the pupils. This situation has negative effects on the sitting posture of the children especially when reading and writing.

Mismatch of classroom furniture and student body dimensions: empirical findings and health implications. Parcells C, Stommel M, Hubbard RP.

A total of 74 (37 male and 37 female) sixth-through eighth-grade students in a Michigan school district participated in the study; their ages ranged from 10 years, 11 months to 14 years, 3 months. Anthropometric measurements (including elbow height, shoulder height, upper arm length, knee height, popliteal height, buttock-popliteal length, and stature) were gathered in several physical education classes, each during a single session. In addition, the furniture dimensions were measured for three styles of chairs and three styles of desks prevalent in the students’ classrooms. Based on both the information about student body dimensions and furniture dimensions, measures of fit or mismatch were constructed.

RESULTS: The data indicate a substantial degree of mismatch between the students’ bodily dimensions and the classroom furniture available to them. Fewer than 20% of students can find acceptable chair/desk combinations. Most students are sitting in chairs with seats that are too high or too deep and at desks that are too high. Even after controlling for body stature, girls are less likely to find fitting chairs.

CONCLUSIONS:

Based on the evidence presented, many sixth through eighth graders must endure seating arrangements in their classrooms that are not conducive to learning.