

# The Epidemiology of Back Pain in Children and Adolescents: A Cross-Sectional Study of 3,669 American Youth

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## INTRODUCTION:

Back pain is a common condition that affects millions of Americans each year, including both adult and pediatric populations. To our knowledge, there has been no study that has epidemiologically studied back pain in a representative cohort of American children and adolescents. The purpose of this study was to establish the prevalence of back pain in American children and adolescents 10-18 years old and investigate for any demographic or physical activity predictors of increased risk.

## METHODS:

A cross-sectional survey-based investigation was performed in an epidemiologic sample of 4,002 children and adolescents, equally split by age and sex, and representing census-weighted distributions of state of residence, race/ethnicity, and health insurance status. Overall prevalence and incidence of back pain (at present and any time in past year) was calculated, and comparative analyses were performed to investigate any relationship between back pain and age, sex, weight, BMI, health insurance status, and level of athletic competition for athletes.

## RESULTS:

After outlier analysis to remove subjects with unusually high or low height, weight, or BMI, 3,669 participants were included in the final analyses. Of the remaining participants, 49.4% were male (n=1,813) and 50.6% were female (n=1,856). The mean age was 14.0±2.5 years and the mean BMI was 21.6±4.4. In total, 33.7% of participants (n=1,236) reported experiencing back pain within the last year, while 4.8% (n=177 participants) reported having back pain at the time of the survey.

Participant age was significantly associated with incidence of back pain ( $p < .001$ ). Trend line analysis revealed that the percentage of children that had back pain in the previous year increased about 4% for each year the children age (see **Figure 1**). Additionally, participants with back pain in the previous year weighed more on average (132.3±33.9 lbs vs. 119.8±34.6 lbs,  $p < .001$ ) and had higher BMIs (22.2 ± 4.4 vs. 21.2 ± 4.4,  $p < .001$ ). Females reported back pain in the previous year significantly more often than males (38.3% vs. 29.0%,  $p < .001$ ).

Out of the 1,236 participants that experienced back pain, lumbar back pain was the most common (68.9%). Almost half (48.9%) of participants with back pain reported experiencing back pain in the evenings, 15.1% reported the pain waking them from sleep, and 40.8% reported back pain in the morning. Treatment for back pain was sought by 40.9% of participants. Of the 505 participants receiving medical treatment, 44.0% used in physical therapy, 34.1% used chiropractic treatment, and 33.9% used massage therapy.

A majority of subjects (n=2,910, 79.3%) stated that they participated in a sport or physical activity, with basketball being the most common sport followed by dance, baseball, football, and soccer. Additionally, for participants in sports significantly associated with back pain, incidence of back pain was significantly associated with the level of competition in those sports ( $p < .001$ ). Junior varsity and varsity athletes demonstrated the highest incidence of back pain (50.0% and 49.5%, respectively) followed by travel team (48.3%), national/international competition (46.8%), local or little league team (36.7%), and recreational athletes (32.1%).

Subjects that used backpacks with two straps were least likely to have back pain (30.6%), while those who used rolling backpacks (54.5%), backpacks with two straps and the waistband fastened (47.5%), and backpacks with one strap (42.6%) had a higher incidence of back pain ( $p < .001$ ). No associations were found between subjects' health insurance status or race/ethnicity and occurrence of back pain.

## DISCUSSION AND CONCLUSION:

The current study quantifies a 33.7% incidence of back pain in the previous year in an epidemiologic, census-derived sample of 3,669 American children and adolescents. Additional statistically significant associations between presence of back pain in the previous year and age, weight, BMI, backpack use, sex, and level of athletic competition were discovered. No association between insurance status or race and back pain was reported. These results will aid in future research and clinical care by demonstrating the epidemiology of back pain within the 10-18 year old American pediatric population.

Figure 1: Percent of sample (N=3,669 American youth) by age with back pain in the previous year (red line, squares) and with back pain currently (blue line, diamonds).

