Judge weight and time worn to minimize backpack pain

August 31 2012

(Medical Xpress)—As students of all ages load up their backpacks for the school year, they may be on their way to creating bad posture habits and increasing their risk for pain.

UC's Nancy Talbott, PhD, an associate professor of rehabilitation sciences in the College of Allied Health Sciences, says there's a key point at which backpacks tip from appropriate to overweight—and that could lead to pain or injury for the wearer.

Talbott has studied backpack use in students from fourth through 12th grades. In a study of junior high aged students, she said the key figure for backpack weight was found to be 10 percent of the student's body weight. That's typically the heaviest a backpack can weigh for students to carry it without changing their posture.

"The most frequently documented changes in posture tend to occur above 10 percent of a wearer's body weight," says Talbott. "Above that, students start to slouch their trunk forward and bend their neck up—that changes all of the postural muscles in the neck and scapular area."

She says wearing a backpack over 20 percent of one's body weight significantly alters posture and stability, though research has documented students carrying bags far above that amount.

Not only can heavy backpacks lead to strain or increased pressure on the spine, Talbott says there are also injuries associated with backpacks

falling out of lockers or students falling down the stairs with their backpacks.

In the same study of junior high students, Talbott measured students' perception of backpack weight—if backpacks were reported as being "heavy," the actual weight correlated with researchers' definition of an overweight bag.

"We found that students were very good at determining whether the weight was above 15 percent or so. If the kids felt it was heavy, it typically was in that 15-20 percent range. They are good judges of their backpack weight."

If a student reports pain associated with a backpack, Talbott says to look at not only the weight of the bag, but how long the student is carrying it and what other items he or she may be holding as well.

"Some students can tolerate a larger weight if they are just wearing it from the car into the school," she says. "But you have other students, who may be waiting at the bus stop or walking to and from school, who can't tolerate that weight. It really is a combination of weight and time that correlates with whether students have pain or not."

When selecting a backpack, Talbott says students should choose a bag that fits them properly—not the biggest one available—and make sure to find one with padded straps and a waist belt.

Roller backpacks may not be the best solution if students have to carry them up and down steps, as they can weigh more due to the added structure.

"Be aware of other things students are carrying, like sports equipment, musical instruments or laptops," she says. "Those bags should be

balanced with the backpack. It all adds up to the total load on the shoulders."

Talbott says there are several options that can help reduce backpack weight for students—more trips to the locker, or dual sets of books. It's best to work with teachers or school officials to find solutions that can avoid injury and get the books to class on time.

Provided by University of Cincinnati