

# A study on school bags of children

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■ **ABSTRACT** : This study investigated the weight of school bags and the factors related to school bag carriage students in two community schools in Allahabad completed with a questionnaire. Measurements of body weight and schoolbag weight were taken and completion of a daily body discomfort chart (BDC). According to the report of the survey mostly children carried a school bag weight ranged from 1.6-9.3 kg over the 5 days. A survey carried out on children's school bags of 9 years of age by the researchers, their mean height 4 inches (3ft 9inches) and average body weight 26 kg, it was observed that sometimes children arch their backs or lean forward causing them to develop poor posture as they grow. Wrong posture while bending and lifting can result in the rupture of the disc. It was found that mostly children carried a weight of 5 kg that was more than 15 per cent of their own body weight. The reported discomfort was higher for boys than girls.

■ **KEY WORDS** : - Body weight, Body discomfort

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There is ongoing concern regarding the weight of children's school bags and the negative consequences of such heavy loads on the developing spine. Despite parent's best effort to protect their child from getting hurt, one of the greatest sources of potential injury which often goes unnoticed is the school bag pack. Children should not carry weight of more than 15 per cent of their own body weight. Children carrying this kind of weight can develop serious back pain and other problems that can require treatment. A number of children may be damaging their spines by carrying school bags. Risks include muscle strain, distortion of the natural S curve of the spine and rounding of the shoulders. To manage the load, children sometimes arch their backs or lean forward, causing them to develop poor posture as they grow. Wrong posture while bending and lifting can result in the rupture of the disc. Wearing a back pack on one shoulder can also cause the child to lean to one side to compensate for the extra weight, resulting in an asymmetrical spine, back pain and a strained shoulder and neck. In severe cases, children can develop a condition called "Scapular winging," when the nerve that supplies the shoulder muscle become pinched causing paralysis.

## Objectives:

The specific objectives are:

- To measure the weight of the school bag.
- To know their anthropometric measurement.
- To determine percentage bodyweight carried.
- To determine types of bags and methods of carriage.
- To reported the discomfort due to schoolbag carriage.

## Hypothesis:

School going children suffer back problems due to heavy weights of their bags.

## RESEARCH METHODS

This study was conducted with an author assisted questionnaire, a body discomfort survey and objective testing, anthropometric measurement and development of a low weight school bag.

## Sample selection:

A convenience sample of 200 children, age 11- 12 years of two communities school out of which 109 were boys and 91 girls. For the purpose of the study, permission was sought

from both the Principals. The Ganga Memorial Nursery School Rajapur and St. Columbus School and College, Rajapur granted ethical approval.

### Tools of selection:

#### Questionnaire:

Interview method was used to extract the information from children of both sexes. Anthropometric measurements were taken, and also a profile of their morning chore was collected from the children.

#### Weighing scale:

A digital weighing machine of Dr. Morepen- Model no. DS-03 was used for the weighing of the bags.

#### Anthropometric measurement:

Anthropometric measurement especially height and body weight of the students were analyzed.

#### Body discomfort chart:

The daily recorded discomfort was assessed on a body discomfort chart (BDC).

#### Duration of carrying the bag on the back:

20 minute mean time (five days of the week).

### Procedure:

Random sampling method was used to collect the data. A brief questionnaire was framed for seeking information on students daily view of their bag weight, and their perceived level of discomfort to school bag carriage. The students were then asked to mark on a intensity of their discomfort between "No discomfort" and "Worst possible discomfort".

### Method of analysis:

Tabulation method was adopted to analyse the data.

### Development of a low weight school bag:

After doing the survey the researchers have designed a school bag according to children's need. Jute as the raw material of the bag, as it is cheaper and easily available is found in abundance in India. Jute is the second most widely used vegetable fibre after cotton. India is the largest producer of jute, but now-a-days jute is losing its commercial value in the market and jute mills are facing stiff competition from synthetic textile market. If this bag is accepted in the market, it will give a boost to jute industry.

### Properties of jute:

Jute is a long, soft shiny vegetable fibre that can be spun into coarse, strong threads. "Jute" is name of the plant or fibres that is used to make burlap, hessian or gunny cloth. Jute is one of the most affordable natural fibres and is second

only to cotton. Jute fibres are composed primarily of the plant material, cellulose and lignin. The fibres are off-white to brown and 1-4 meters long.

### Qualities of this bag are :

- It is water proof and oil proof.
- Separate space for Tiffin box, pencil box and water bottle.
- Adjustable shoulder strap.
- Sufficient space for books and copies.
- Light weight 3.48 g.
- Easy to clean.

## RESEARCH FINDINGS AND DISCUSSION

Of the 200 consent forms issued, 179 were returned. This included 98 boys and 81 girls of mean age 11.2 years.

### Weight of school bag:

School bag weight ranged from 1.6-9.3 kg over the 5 days. It was found that on average, boys carried heavier (3.3-9.3) school bags than girls (1.6-8.7) The weekly mean school bag weight was 5.4 kg overall school bag weighed heaviest on Friday (mean weight 6.1 kg) and were the lightest on Tuesday (mean weight 4.6 kg)

### School bag weight as a percentage of body weight:

The mean school bag weight as a percentage of mean body weight carried by the student was 13 per cent body weight carried in school bags ranged from 4 per cent- 30 per cent over the course of the five days of weighing. Boys carried a slightly larger proportion of their body weight (mean-14%, range: 5%-30%) than girls (mean 12%, range: 2%-25%).

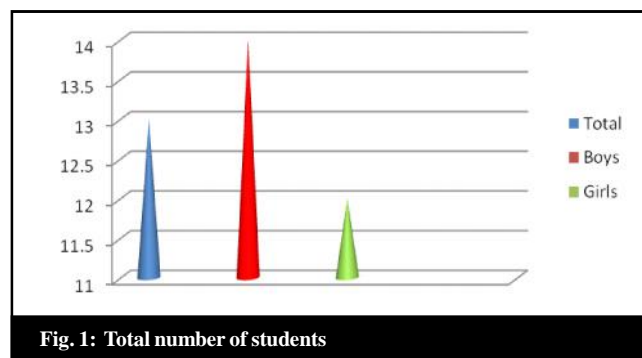


Fig. 1: Total number of students

### Percentage of body weight carriage:

The mean percentage body weight carried by those who had an additional bag was 16%. The loads carried with regard to % body weight.

### Types of school bag:

Almost all students, 95% (n=47) used back pack-style

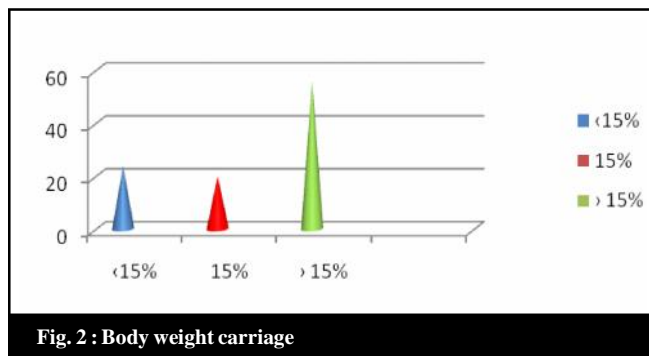


Fig. 2 : Body weight carriage

school bags with two straps, but only 65 per cent carried their school bags on their backs using two strap.

### School bag related body discomfort:

Girls reported more discomfort due to carrying a school bag in the initial questionnaire than boys. However, when asked on a daily basis, 69 per cent of both boys and girls reported discomfort. The number of reports of discomfort increased as the week continued. The greatest number reported discomfort due to carrying their school bag on Friday. It may have been so, because of the week's tiredness, projected itself highest on the last day, before the weekend. The majority of discomfort (62%) was reported in the shoulder region, followed by 28 per cent reported in the back with negligible percentages reported elsewhere.

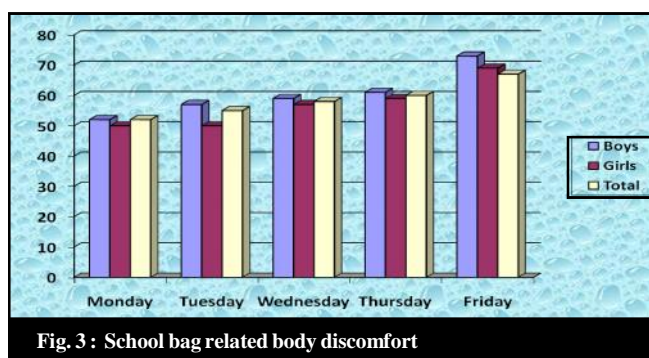


Fig. 3 : School bag related body discomfort

Growing numbers of children are developing irreversible back deformities because of the weight of the bags they carry to school, experts warned yesterday. Half of all children suffer back pain by the age of 14 and doctors are reporting a rise in cases of spinal abnormalities in pupils, including disfiguring curvatures known as scoliosis. Overloaded school bags that are up to double the size of those carried ten years ago are contributing to the surge, it is feared. 'Children's skeletons are still growing so carrying heavy bags can cause lasting damage. 'Many are carrying their bags on one shoulder or are increasingly carrying them on the crook of their elbow, so are placing a great strain on the spine. 'A lot of the bags

being used are bulky sports bags, which are twice the size of backpacks used a decade ago. 'If children have bigger bags then they tend to fill them. Add on sports equipment, musical instruments and heavy wet weather clothes and children are totally overloaded.

The boys and girls carried, the bags from home to the rickshaw trolley which varied from a 1 minute walk to a 2 minute walk, and then from the trolley to the class rooms, which was about 2.93 seconds which implicated that children for these 12 formative years of their lives carried bag packs on their backs, which were out of proportion with their body weight. It is at the tender age of 3.5 years that these children begin this journey of carrying bag packs, to 15.5 years. At the tender age of 3.5, bones are stretching and growth is taking place at a rapid pace, children tend to bend from their back in order to carry the bags, which may have serious postural ramifications. These may turn out to be difficult to correct later in life, apart from bones and cartilages being at greater risk to deform.

### Conclusion:

Was completed and it was observed that sometimes children arch their backs or lean forward causing them to develop poor posture as they grow wrong posture while bending and lifting can result in the rupture of the disc. Compared to brief cases children prefer to use back packs further the children and teens preferred to use them because they are fashionable and hold more items. According to the report of the survey mostly children carried a weight of 5 kg. that is more than 15 per cent of the body weight. The mean school bag weight differed slightly according to gender. Boys carried a mean weight of 5.3 compared to girls who carried a mean weight of 4.7 Day of the week was also found to be a factor determining the average school bag weight. The school bag was heaviest on Fridays with a mean weight of 6.1 kg. and the lightest on Tuesdays with a mean weight of 4.6 kg. This reflects the varied demands on school children on a day to day basis. The number of additional bag carried an additional bag and this is perhaps due to a higher level of sports participation by boys, over the course of the five days of weighing. The weight of school bags ranged from (4-30%) body weight. The mean school bag weight as a percentage of mean body weight carried by the students was 13 per cent and the most popular style of school bag was found to be a back pack style bag with two straps (95%) similar to that found by others. However, it is disappointing that only 66 per cent of students carry their school bag on two shoulders.

### Suggestions:

Back problems are becoming an increasing issue among school children and schools no longer have adequate desk space for pupils to store heavy books, so we must need to have an urgent overview of this issue. Parents are being urged to keep an eye on children's back packs so that they do not cause problems for their health when they are older.

- When shopping for a school bag for your child, make sure you choose a lightweight bag that's the right shape for your child's back.
- As well as looking for bags with the usual safety features like reflective strips, check how easy the bag is to carry around. Bags with wheels are a great idea to take the load off your child's back.
- Keep an eye on your child's bag throughout the term to make sure nothing unnecessary is in there, and encourage your child to pack his school bag the night before to avoid carrying any extra weight.
- Fashionable school accessories tend to be heavy, so avoid these.
- Tell your child not to carry his school bag around with him unless he has to. On the bus or whilst waiting outside classrooms, it can be placed on the floor.
- Make sure that items cannot move around during transit, as this could upset your child's gravity.
- Encourage the teachers to keep the books in the school almirah and bring only those copies needed for homework.
- Regularly clean out the backpack, since your child may be storing unneeded items.
- Regularly ask your child if their back pack is causing fatigue or pain. If so, lighten the load and adjust the fitting.
- Use the backpack's compartments.

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