

Research Article

THE RELATIONSHIP BETWEEN STUDENTS' STANDARD BAGS & THEIR SKELETON DISORDERS IN AHWAZ

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ABSTRACT

The main goal of doing this research is surveying on the relationship between students' Skeleton disorder of ergonomic bags in Ahwaz. The population includes 50000 male & female students in elementary schools & by using random-cluster methods was selected 30 classes that average 25 students studied in each of them (as sample). The dimensions of bag were surveyed as standard rules. The data collection included; scales, tape measure, stadiometer, grid plate & for analysis the data was used descriptive statistic; mean, frequency, percentage & deductive statistic; correlation coefficient & chi-square test for surveying anomalies. The results of research showed that there is significant relationship between back lordosis anomaly & forward head posture & drooping shoulders abnormalities & torticollis anomaly & abnormal kyphosis & students' ergonomic bags. Discussion: regarding to the results of research & same studies of heavy students' bags & put up in incorrect way that moreover the backache due to long term complication such as changes in the angles of the spine and neck, problems standing and walking, and hazardous waste, such as a herniated disc. Ministry of Health and Medical Education emphasize on the producing the standard bags, standard health in schools.

Keywords: *Skeleton Abnormalities, Upper Limb, Ergonomic, Student, Bag*

INTRODUCTION

The prevalence of neck pain with no known cause between 67 to 71% has been reported in human society shows that about two-thirds of society experienced neck pain during their life. In the other countries the researches showed that the personal characteristics (physical status) & weight & the frame of their bags are the basic factors of musculoskeletal disorders. The weight, frame & kind of carrying of bag as unappropriate caused to change in individual posture & physical activities in next times of life. Regarding to importance of neck pain as second common musculoskeletal & has high costs, the goal of this research is surveying on the role of harmful factors in students' neck pain to providence aches among adolescences & youth. All of us worry because of our children's health especially when we are not near them & school is where that our children are at it. In current decades most students tend to backpacks & since paid more attention to their efficiency that their appearance so carrying the heavy bags with in-correct ways increase in America (1999) recognized 6000 persons suffered because of it (Wang, 2013)

Now, most of persons (students & individuals) who have improper habits, they have skeleton disorders. Correct usage of standard facilities & equipments in schools & eliminate the false physical habits can be effective to prevent the disorders.

Children & paying attention to their healthy are one of the tickling of families, schools & authorities. Most of done researches showed the lack of correct growth of children in developing countries that the main reasons are because of lack of attention to the bag, shoes, chairs & other facilities that children need especially in the elementary schools.

Always, researchers pay attention to the weight of bag & the way of the carrying ways to their bodies & its standard such as longitude & width of shoes, length & comfortable of chairs in elementary schools & their effects of skeleton & muscles. Heavy bags, unsuitable shoes & abnormal desks & chairs caused to various disorders on students' skeleton & muscles.

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The standard weight of backpacks must be 10-15 percentage of students' weight; it means if a student is 20Kg, his bag's weight must be 2-3 Kg (Parivash Halm Seresht, 1998).

Of the weight of bag is higher than standard, it causes to pressure on neck, head, shoulders & spine & also causes to scoliosis & bend the neck & body subnormal that then due to the changes in their skeleton. If the shoes are not appropriate cause to main harm to spine, upper & limber extremities. The shoes must be have 2-3Cm heels & be soft & lightweight & closed the front & behind & flat in toes (Marofi and Akbari).

Body Posture

There are various understanding & definition in body posture & is taken many interpretations of this concept. The body posture of persons is determined based on the size of body & dimensions & size of equipment. So that the body in this way is limited to the number and nature of the relationship will depend on the person & work space. This relationship can be physical (seating, job level, etc.) & short-term or long-term consequences it may have on a person's health is extremely poor (Pisint, 2007).

There is a common postural abnormality among Iranian students. That many factors are involved in the development of this disorder, many of them rooted in the culture & lifestyle of people. The habits such as carrying bags or backpacks, wear unsuitable shoes & no-standard seats were used in the school. The main causes of postural abnormalities are among students. These disorders are acquired & they made because of false habits & usage the standard equipment.

The Causes of Congenital Malformations Caused by Improper Carrying Bags

Carrying the improper subjects such as bags caused to abnormalities in skeletal and muscular structure of the body. School is one of the most important organized institutes that must be provided the students' physical & mental growth in the healthy places. If do not provide a suitable environment for the growth & development of students, they face to developmental disorders and diseases of childhood. This is not only cause to obstacles in their education & learning but also cause to basic & main reasons for physical & mental disorders & diseases (Javadipor, 2011).

One of the most common way of carrying books & notebooks is bag & can be considered it a participants of children. But its abnormality caused to hard hurt their spine & also to their nerves. If done by a shoulder carrying backpacks causing a lot of pressure on this side & causes abnormal curvature of the spine. This although in adults who are carrying heavy bags is also important, but in children beads is more glaring & underlying scoliosis (abnormal curvature of the spine to the side) because it is still growing. The strain of carrying bags will be caused to damage the nerve roots of shoulder & neck. Too heavy bags to carry books & school supplies as a result of a relatively common problem is commonly seen, carry it with inappropriate & unethical sometimes lasting negative effects on joints and nerve roots (Noori, 2004).

The beginning of the backpack should end above the shoulders and it should not be lower than the top of the hip bone.

Bar backpack placed on the shoulders should have a width of 5 cm, & should not raise the arm or shoulder & arm muscles & the nerves mired affected area.

Lumbar strap bags (backpacks) should be 50 to 70% of the weight off the shoulders & spine to the hip bone conduction to be equal pressure on the bones, joints & muscles.

The heavier things should be placed close to the central axis of the body so close to the center of gravity.

Heavy backpacks that are much lower than a person's belly leaning forward & putting a lot of pressure on your back (Showman, 2010)

Standard Bag

One of the particular important school supplies is the backpack that when buying it just pays attention to its big & beautiful while the most important metric is its standard.

The first issue is the backpack or bag must be standard in weight, size, material in use & color.

Weight of Bag: Backpack weight distribution and the same standard should be enough to have the student body. Based on this research, a consensus that there is no one hundred percent, but the weight bags to

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students 8-15 or 10 -15% of body weight is recommended to use their own bags. Backpack should be fit enough space & it does not focus because otherwise all parts are together.

But seen the students go school with too heavy bags & in long time causes to affect on their spine. The students force to carrying their books & supplies. If they carry backpacks in correct way & placed in them standard weight, bags don't have any harms to them. Hasan Daneshmandi, Assistance professor of Physical Education & Sport Science University stated that benefits of backpacks than other bags:

Bags that same pressure on the spine caused to the lowest harm, & students who bring heavy bags because they bend to one side of the body, increases the asymmetric shoulders & crooked neck disorders. Weight of school bags depend to students' height, weight & physical characteristics of students & cannot state a specific formula for weighting the bag for all the students.

The backpack must be fitted the age, height & growth of students that needs to bachelor's activities. Heavy bags & backpacks with long strap cause side effects students' lumbar & cervical tilt the head-to-front.

Bags on the one shoulder & heavy backpacks which are carried in the long distances cause to abnormalities shoulder & lumbar are asymmetric. The long term complications may forever remain the backbone of the students.

Punk (2014) compared the physical dimensions of educational furniture & bags among students in Yunman primary school. That was consisted of 90 girls & 90 boys of primary school students aged 7-12 years.

The results indicated that improper bags cause abnormalities in body.

Ergonomic Bags

Ergonomic bags are designed to balance the weight is divided on all parts of your body & you do not feel any extra pressure. Compartments are placed differently, that putting various objects such as laptops, purses and cosmetics to keep the weight balance. These kinds of bags balanced the weight on the shoulders, neck & back, evenly.

Kingsley (2012) Studied on determining the proportion of bags with students' physical dimensions in Hong Kong. They believed that unsuitable bags due to abnormalities in the body, carrying heavy backpacks & incorrect technique can also lead to long-term complications such as pain in the spine & neck angle changes, problems standing & walking, & hazardous waste such as hernia the disc.

Stryker (2008) studied on the anthropometric considerations for designing classroom desks & chairs in India were in rural schools. The results showed that when compared to children 10 and 15 years old were more differences were observed (16.12%_ 42.4%). So we can say that designing for children 10 years old & anthropometric characteristics of children 15 years without follow suit. As a result of these studies is a step in the prevention of skeletal abnormalities.

Mousavi (2007) also found in another study in 2008 that carrying school bag for more than 30 minutes a day can increase the risk of neck pain.

Yousefi (2012) surveyed on the relationship between some of ergonomic bags characteristics & male students' anthropometric indexes in Kermanshah & also studied on the deformity of the spine and organs upper skeletal & the results: disproportionate weight of the bag & the body has positive relationship between students & asymmetric shoulder disorders.

Fariba Tarahani (2010) surveyed on the standard children's bags in primary schools in KhooramAbad. The results of research showed that there is significant relationship between carrying the heavy bags on one shoulder & back pains in children & many students carry the heavier bags than the standard weight & improperly, leading to pain also other side effects in them.

Shams *et al.*, (2010) did a cross-sectional study on 213 students of Tehran found that the weight of school bags, their relationship has been quite significant neck pain.

MATERIALS AND METHODS

The method of this is descriptive & correlation. The descriptive method is the kind of after event. The population included 50000 boy & girls students in primary schools & by using clustered-randomly

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method are selected 30 classrooms which of them included 25 persons. The tool data included scales, tape measure, stadiometer, grid plate. After collecting data must be analyzing them & for it was used mean, frequency, percentage & in deductive statistics was used correlation coefficient & chi-square test for abnormality. Also all of them are evaluated by SPSS22 & other statistic software.

RESULTS AND DISCUSSION

There is relationship between kyphosis abnormal & ergonomics bags among elementary school students.

Table 1: The results of chi-square test between kyphosis abnormal & ergonomics bags

Indexes	Value	Freedom rate	p-value
Correlation coefficient	0.98	3	0.00

Regarding to the statistic test $p=0.00$ & $x^2=0.98$ there is relationship between kyphosis abnormal & ergonomics bags so this hypothesis is determined

There is relationship between the anomaly drooping shoulders & ergonomics bags

Table 2: The results of chi-square test between the anomaly drooping shoulders & ergonomics bags

Indexes	Value	Freedom rate	p-value
Correlation coefficient	30.23	6	0.01

**** The $\alpha \leq 0.05$ is meaningful**

Regarding to the statistic result $p=0.01$, $x^2=30.23$ there is relationship between the anomaly drooping shoulders & ergonomics bags so this hypothesis is determined.

There is relationship between torticollis & ergonomic bags

Table 3: The results of chi-square test between lordosis & ergonomics bags

Indexes	Value	Freedom rate	p-value
Correlation coefficient	33.09	3	0.02**

**** The $\alpha \leq 0.05$ is meaningful**

Regarding to the statistic result $p=0.02$, $x^2=33.09$ there is relationship between the lordosis & ergonomics bags so this hypothesis is determined.

There is relationship between forward head posture abnormality & ergonomics bags primary school students.

Table 4: The results of chi-square test between forward head posture abnormality & ergonomic bags

Indexes	Value	Freedom rate	p-value
Correlation coefficient	30.84	3	0.04**

**** The $\alpha \leq 0.05$ is meaningful**

Regarding to the statistic result $p=0.04$, $x^2=30.84$ there is relationship between forward head posture abnormality & ergonomic bags so this hypothesis is determined.

There is relationship between scoliosis abnormality & ergonomic bags among students in primary schools

Table 5: The results of chi-square test between scoliosis abnormality & ergonomic bags

Indexes	Value	Freedom rate	p-value
Correlation coefficient	5.22	3	0.52**

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Regarding to the statistic result $p=0.52$, $\chi^2=5.22$ there is not relationship between scoliosis abnormality & ergonomic bags so this hypothesis is not determined.

There is relationship between lordosis & ergonomic bags among students in primary schools

Table 1: The results of chi-square test between lordosis & ergonomic bags

Indexes	Value	Freedom rate	p-value
Correlation coefficient	56.41	3	0.00**

** The $\alpha \leq 0.05$ is meaningful

Regarding to the statistic result $p=0.00$, $\chi^2=56.41$ there is relationship between the lordosis & ergonomics bags so this hypothesis is determined

Discussion

According to the done researches in about appropriate bags must be standard in size, weight & color. Backpack weight distribution & the same standard should be enough to have the student body, based on this research, there is no same negotiation in about the bag weight but it is commented that the weight of bags must be 8-15 or 10-15 percents of weight of students' body, the size of backpacks must be normal space is not concentrated in any way because otherwise all parts are together.

Backpack is designed to fit the physical dimensions of the students in the country which requires a bachelor's activities.

This research found that the heavy bags & backpacks had used a long strap to carry it from one side & for settling that problem head-to-front & crooked neck waist deep effect on the students. This research & other done researches, Eghbali (2003) studied on the male students in guidance schools & found that most of them carrying in wrong ways & most of them had distorted spine that might cause these problems is the wrong habits (Darush, Jedali studied on the students' bodies postures, 2001)- Reza ghara Khanlo, surveying on the level of abnormalities among male students, 2007)- Morteza (2011) the effects of bags weight with different weight on EMG muscles among twelve male students, Master thesis, Ahvaz Shahid Chamran University.

Conclusion

The results of this study and similar studies, many students carry heavy backpacks and incorrect technique can also lead to long-term complications such as pain in the spine & neck angle changes, problems standing & walking and hazardous waste, such as a herniated disc.

As awareness of the effects of carrying heavy backpacks can have a significant impact in reducing these risks, is to inform the parents or guardians of the results of the research schools is necessary. Parents & schools can consider the closet for students so that fewer daily office work & placed in bags for children motivate children to use small office & lighter interfere in this matter.

Parents also help children monitor the discharge of backpacks, children & eliminating unnecessary picking bags & teaching children to use both shoulder strap & can close the son of the spine. Ministry of Health and Medical Education supervise on standard bags production.

REFERENCES

- Australian Physiotherapy Association (2006).** Media release: Don't let your education weigh you down! http://apa.advsol.com.au/physio_and_health/media/download/2006/Backtoschool_backpacks.pdf [Accessed on 15 September 2007].
- Daneshmandi H and Alizadeh K (2008).** Corrective exercises. Recognizing the exercises, Semat Edition, Sport Science & Physical Education Collage
- Daneshmandi H, Alizadeh M and Gharakhanlo R (2004).** Corrective exercises. Recognizing the exercises, Semat Edition, Sport Science & Physical Education Collage, Tehran
- Fariba T (2010).** Surveying on standard of the children's bags in primary schools Khoramshahr. *Science Magazine, Lorestan Medical Science University* 11course. No 1, year 2009.

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- Ghorbani B and Alireza Gh (2009).** The status of spinal disorders in male students of schools Gachsaran, 2009. *Seventh International Conference on Physical Education and Sports Science, Tehran, March 2009.*
- Haselgrove C, Straker L, Smith A and O'Sullivan P et al., (2008).** Perceived school bag load, duration of carriage, and method of transport to school are associated with spinal pain in adolescents: an observational study. *Australian Journal of Physiotherapy* **54** 193-200.
- Javadipor M (2011).** The effects of carrying bags with different weight on muscle electromyography changes among twelve male students. Master thesis, Ahwaz Shahid Chamran University.
- Kingsley R and Chin J (2010).** Aguid to early detection of scoliosis. *Contemporary Pediatrics.*
- Maryam F (2014).** The Role of the weight, shape and carrying school bag & demographic characteristics of high school students in the city of Babol, neck pain. *Proceedings of the Second Congress of Sports Schools, Tehran: Department of Physical Education Department of Education.*
- Mousavi SJ, Parnianpour M and Montazeri A et al., (2007).** Translation and validation study of the Iranian version of neck disability index and the neck pain and disability scale. *Spine* **32** E825-E831.
- Nori SM (2004).** *School Health*, first edition (Tehran, Vaghefi).
- Payneck Ogilvie F (2014).** Back pain in children and adolescent. *Pediatric Clinic of North America* **43** 899 - 917.
- Research and planning unit of the Ministry of Education (2009).** Proceedings of the Second Congress of sports schools. Tehran: Department of Physical Education Department of Education.
- Sahrmann SH (2012).** Diagnosis and treatment of movement impairment syndrome. mosby, Missouri pp3-12-194.
- Wang YT, Pascoe DD, Wimer W (2013).** Evaluation of book pack load during walking. *Ergonomics* **44** 858-869.
- Yusefi K (2011).** the relationship between some ergonomic features skeleton with anthropometric indices students Kermanshah & deformity of the spine & organs upper bodies. *Proceedings of the Second Congress of Sports Schools, Tehran: Department of Physical Education Department of Education.*