

Level of Awareness of Posture in young people

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Abstract

Low back pain (LBP) is a common musculoskeletal disorder which is mainly associated with the ergonomically incorrect working conditions. Therefore, the purpose of this study was to assess the awareness about back care disciplines among high school children in Karachi. A cross-sectional study was conducted in Karachi to study the awareness about back care disciplines among high school level. 100 High school level students from different school and age between 15-18 years were requested to complete a 13 item questionnaire consisted of images related to correct and incorrect back disciplines in various daily activities. Out of 100, 95 students were completed and return the questionnaire with the response rate of 95.2%. Seventy percent of the students were unaware about the correct back discipline while washing clothes manually and more than half of the students (52%) were unaware about correct back pack carrying discipline. Furthermore 77% of the respondents were unaware about the correct sleeping method of side lying posture with head supported by a pillow. The gaps in awareness regarding back care disciplines in daily activities of standing, sleeping carrying back pack and carrying a weight are existed amongst the high school level students and more integrated teaching regarding this needs to be introduced.

Key Words: Awareness, Back care disciplines, Science,

INTRODUCTION

What is good posture?

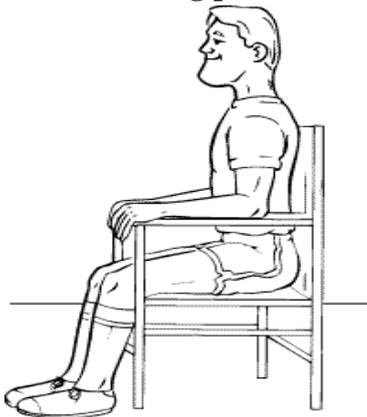
In which you hold your body upright against gravity while standing, sitting or lying down. Good posture involves training Posture is the position your body to stand, walk, sit and lie in positions where the least strain is placed on supporting muscles and ligaments during movement or weight-bearing activities.

Proper posture:

- Keeps bones and joints in the correct alignment so that muscles are being used properly.
- Helps decrease the abnormal wearing of joint surfaces that could result in arthritis.
- Decreases the stress on the ligaments holding the joints of the spine together.
- Prevents the spine from becoming fixed in abnormal positions.
- Prevents fatigue because muscles are being used more efficiently, allowing the body to use less energy.
- Prevents strain or overuse problems.
- Prevents backache and muscular pain.
- Contributes to a good appearance.

Proper posture requirements

Correct sitting position



- Sit up with your back straight and your shoulders back. Your buttocks should touch the back of your chair.
- All three normal back curves should be present while sitting. A small, rolled-up towel or a lumbar roll can be used to help you maintain the normal curves in your back.

Here's how to find a good sitting position when you're not using a back support or lumbar roll:

- Sit at the end of your chair and slouch completely.
- Draw yourself up and accentuate the curve of your back as far as possible. Hold for a few seconds.
- Release the position slightly (about 10 degrees). This is a good sitting posture.

Distribute your body weight evenly on both hips.

Bend your knees at a right angle. Keep your knees even with or slightly higher than your hips. (Use a foot rest or stool if necessary). Your legs should not be crossed.

Keep your feet flat on the floor.

Try to avoid sitting in the same position for more than 30 minutes.

At work, adjust your chair height and work station so you can sit up close to your work and tilt it up at you. Rest your elbows and arms on your chair or desk, keeping your shoulders relaxed.

When sitting in a chair that rolls and pivots, don't twist at the waist while sitting. Instead, turn your whole body.

When standing up from the sitting position, move to the front of the seat of your chair. Stand up by straightening your legs. Avoid bending forward at your waist. Immediately stretch your back by doing 10 standing backbends.

Correct driving position

- Use a back support (lumbar roll) at the curve of your back. Your knees should be at the same level or higher than your hips.
- Move the seat close to the steering wheel to support the curve of your back. The seat should be close enough to allow your knees to bend and your feet to reach the pedals.

Correct lifting position



- If you must lift objects, do not try to lift objects that are awkward or are heavier than 30 pounds.
- Before you lift a heavy object, make sure you have firm footing.
- To pick up an object that is lower than the level of your waist, keep your back straight and bend at your knees and hips. **Do not bend forward at the waist with your knees straight.**
- Stand with a wide stance close to the object you are trying to pick up and keep your feet firm on the ground. Tighten your stomach muscles and lift the object using your leg muscles. Straighten your knees in a steady motion. Don't jerk the object up to your body.
- Stand completely upright without twisting. Always move your feet forward when lifting an object.
- If you are lifting an object from a table, slide it to the edge of the table so that you can hold it close to your body. Bend your knees so that you are close to the object. Use your legs to lift the object and come to a standing position.
- Avoid lifting heavy objects above waist level.
- Hold packages close to your body with your arms bent. Keep your stomach muscles tight. Take small steps and go slowly.
- To lower the object, place your feet as you did to lift, tighten stomach muscles and bend your hips and knees.

What is the best position for sleeping and lying down?

No matter what position you lie in, the pillow should be under your head, but not your shoulders, and should be a thickness that allows your head to be in a normal position.

- Try to sleep in a position which helps you maintain the curve in your back (such as on your back with a pillow under your knees or a lumbar roll under your lower back; or on your side with your knees slightly bent). Do not sleep on your side with your knees drawn up to your chest. You may want to avoid sleeping on your stomach, especially on a saggy mattress, since this can cause back strain and can be uncomfortable for your neck.
- Select a firm mattress and box spring set that does not sag. If necessary, place a board under your mattress. You can also place the mattress on the floor temporarily if necessary. If you've always slept on a soft surface, it may be more painful to change to a hard surface. Try to do what's most comfortable for you.
- Try using a back support (lumbar support) at night to make you more comfortable. A rolled sheet or towel tied around your waist may be helpful.
- When standing up from the lying position, turn on your side draws up both knees and swings your legs on the side of the bed. Sit up by pushing yourself up with your hands. Avoid bending forward at your waist.

The above advice will benefit a majority of people with back pain. If any of the above guidelines causes an increase of pain or spreading of pain to the legs, do not continue the activity and seek the advice of a physician or physical therapist.

Low back pain (LBP) is a common patient complaint where pain experienced in the lumbosacral spinal and paraspinal regions, including the buttocks and upper thigh¹. Recent studies have shown that the lifetime prevalence of low back pain is high as 84%, and the prevalence of chronic low back pain is about 23%, with 11-12% of the population being disabled². Heyman, 2009 has reported that the musculoskeletal discomfort and back pain problems are evident adults and children³. It has reported that prevalence of low back pain is higher among girls than boys and increased with age in both sexes⁴. Back pain problems are mainly associated with the ergonomically incorrect working conditions requiring repetitive heavy lifting and equipment⁵. Most of such tasks are modifiable and a survey conducted by the North American Spine Society (NASS), has reported that 42.6% of NASS member physicians have treated children or teens suffering from back pain or spine trauma caused by overloaded or improperly used backpacks. Triguero et al., 2012 has shown the multifactorial etiology of low back pain as combination of school absences, parental pain, sleeping difficulties, inappropriate school furniture and postural deviations at the sagittal and frontal planes⁶. However, such symptoms in childhood, particularly as they are so common, may have important consequences for chronic low back pain in adulthood which can led to an explosion in costs. The situation in Karachi, Pakistan also same to the other countries and recent studies have found that the highest prevalence of musculoskeletal disorder is low back pain among working population⁷. Furthermore, Jayaratne & Fernando has found that the prevalence of low back pain among schoolchildren is 24.4% which affected to their academic performance and school attendance⁸. It is advisable to stand by stand tall with the chest lifted up and out, stomach muscles pulled in and bottom in and sitting with hips slightly higher than knees without crossing legs to reduce low back strain. The correct posture for reaching is stand on a stool to reach things that are above the shoulder level. We believe that clear picture towards a balanced-posture, body function and movement patterns, as well as their ergonomic implications, can minimize and even prevent these problems. Such an ergonomics awareness educational program has to start at childhood and should be an integral part of the curriculum in the schools. Therefore, in this research the core focus was to explore the back care discipline awareness among high school children in Karachi.

Literature Reviews

Influence of carrying book bags on gait cycle and posture of youths. Pascoe¹, Pascoe DE, Wang YT, Shim DM, Kim CK 1997. The purpose of this investigation was to determine the impact of different methods of carrying book bags on static posture and gait kinematics of youths aged 11-13 years. Subjects participated in four conditions: without bag (WO), one-strap backpack (1BP), two-strap backpack (2BP), and one-strap athletic bag (ATH). One-strap bags (1BP, ATH) promoted lateral spinal bending and shoulder elevation, while the two-strap backpack significantly reduced these book bag carrying stresses. ATH promoted greater angular motion of the head and trunk as compared to backpack book bags. Carrying a backpack (1BP, 2BP) promoted significant forward lean of head and trunk compared to ATH or WO. In conclusion, the daily physical stresses associated with carrying book bags on one shoulder (1BP, ATH) significantly alters the posture and gait of youth

The effect of backpacks on the lumbar spine in children: a standing magnetic resonance imaging study. Neuschwander TB¹, Cutrone J, Macias BR, et al The purpose of this study is to measure the lumbar spine response to typical school backpack loads in healthy children. Children commonly carry school backpacks of 10% to 22% bodyweight. Despite growing concern among parents about safety, there are no imaging studies which describe the effect of backpack loads on the spine in children. Three boys and 5 girls, age 11 +/- 2 years (mean +/- SD) underwent T2 weighted sagittal and coronal MRI scans of the lumbar spine while standing. Scans were repeated with 4, 8, and 12 kg backpack loads, which represented approximately 10%, 20%, and 30% body weight for our sample. Main outcome measures were disc compression, defined as post- minus preloading disc height, and lumbar asymmetry, defined as the coronal Cobb angle between the superior endplates of S1 and L1.

Backpack loads are responsible for a significant amount of back pain in children, which in part, may be due to changes in lumbar disc height or curvature. This is the first upright MRI study to document reduced disc height and greater lumbar asymmetry for common backpack loads in children.

The effects of bag style on muscle activity of the trapezius, erector spinae and latissimus dorsi during walking in female university students.

Hardie R¹, Haskew R¹, Harris J¹, Hughes G¹. 2015. The aim of the study was to investigate the effects of different bag conditions on muscle activity of the trapezius, erector spinae and latissimus dorsi muscles in female university students during walking. Twelve female university students walked on a treadmill for 5 minutes at 1.1 m/s during five conditions; control, 1 strapped rucksack, 2 strapped rucksacks, ipsilateral shoulder strap and contralateral shoulder strap, each containing 10% bodyweight. Electromyography for the trapezius, erector spinae and latissimus dorsi was recorded for the last 30 s of each condition. Two-way ANOVA and paired t-tests were used to identify differences between right and left muscles and between bag conditions. Results showed that muscle activity of the left trapezius was significantly higher than the right trapezius during the 1 strap rucksack condition. For the left trapezius, the 2 strapped rucksack and the control condition had significantly lower muscle activity compared to the 1 strapped rucksack and the ipsilateral shoulder strap. For the left erector spinae muscle, there was significantly greater muscle activity when wearing the contralateral shoulder strap compared to the control. For the right erector spinae, significantly lower muscle activity was observed when wearing the 2 strapped rucksack compared to the ipsilateral shoulder strap and contralateral shoulder strap. There were no significant differences in muscle activity of the latissimus dorsi muscles between any of the bag conditions. These findings suggest that a two strapped rucksack should be used when carrying loads to reduce spinal muscle activity which may, in turn, reduce reports of back pain in female adolescents.

The biomechanical and clinical significance of the lumbar erector spinae flexion-relaxation phenomenon: a review of literature.

Colloca CJ¹, Hinrichs RN.2005. The aim of this study was to review the biomedical literature to ascertain the biomechanical and clinical significance of the lumbar erector spinae flexion-relaxation phenomenon (FRP). Index Medicus via PubMed, the Noble Science Library's e-journal archives, and the Manual Alternative and Natural Therapy Index System databases were searched using the same search terms.

The presence of the FRP during trunk flexion represents myoelectric silence consistent with increased load sharing of the posterior disco ligamentous passive structures. Passive contributions from erector spinae stretching during the flexion posture and active contributions from other muscles (quadratus lumborum and deep erector spinae among others) further assist in load sharing in the trunk flexion posture. A number of studies have shown differences in the FRP between patients with chronic low back pain and healthy individuals, and the reliability of the assessment. Persistent activation of the lumbar erector spinae musculature among patients with back pain may represent the body's attempt to stabilize injured or diseased spinal structures via reflexogenic ligamentomuscular activation thereby protecting them from further injury and avoiding pain. The myoelectric silencing of the erector spinae muscles in the trunk flexion posture is indicative of increased load sharing on passive structures, which tissues have been found to fail under excessive loading conditions and shown to be a source of low back pain. The studies that show differences in the presence of the FRP among patients and control subjects are encouraging for this type of clinical assessment and suggest that assessment of the FRP is a valuable objective clinical tool to aid in the diagnosis and treatment of patients with low back pain.

Objective

This study is design to observe the Level of Awareness of Posture in young people.

Methodology

3.1- Material and Methods:

Some High Schools of Karachi, Pakistan were identified from the data base of the Director of Education (planning), and the purpose of the study was clearly explained to them and the approval was obtained. Students who were unwilling to participate in the research, absent on the day of data collection students were excluded from the study. Upon permission from the respective principals of the nine high schools selected to participate the survey, the author clearly explained the questionnaire and distributed it to the class representative of each class. The survey required approximately 15 min, after which the author collected the questionnaire from the class representative

3.2-Study Design

Observational Study (A Cross-sectional Survey)

3.3-Study setting

This study will be conducted in some high school of Karachi.

3.4-Study Duration

The duration of study will be 6 months

3.5-Sample Size

A sample size of 100 students will selected

3.6-Participants and procedure

A survey was implemented in this study. The questionnaire was prepared by principal investigator and pre tested with 20 students who were not part of this study sample. The questionnaire was consisted of 13 images related to correct and incorrect back care disciplines in various daily activities including standing, washing, sitting, and gardening, lifting a weight, carrying a weight and sleeping. Standing component consisted of two images related to working in front of a table at hip level in standing and standing erect. Back discipline related to washing consisted of one image. Sitting posture consisted of three images related to sitting in a high back rest chair, low back rest chair and while driving. One image was included related to keeping a weight in a cupboard at higher level. Three images were included in to the carrying a weight category. Such as carrying one object, two buckets and back pack. In the sleeping category two images were included related to the proper sleeping posture and correct mattress use.

3.6.1-Inclusive Criteria

- Both male and female students are included.
- 15-18 Years of age.
- Only 9th and 10th class students.

3.6.2-Exclusive Criteria

- Absent students.
- 1 to 8th class.
- Students with eye infection not able to read the questionnaire.

3.7-Ethical Considerations

Study shall be conducted in accordance with the ethical considerations kept in mind

- Explaining propose of study to the selected population before data collection.
- The study shall have no potential physical and emotional harm to participants.
- All data collected will be coded in order to protect identity, and shall not be disclosed to anyone.
- All inquiries concerning the activity shall have been answered to satisfaction.

3.8-Limitations of study

Results of the study may be affected by

- Short duration of study.
- Limited financial resources.
- Small population and thus smaller sample size.
- Also the duration of the study was limited as the thesis had to be completed and submitted within the time frame allocated by the University for the Degree Completion. Had there been more time the sample size could have been much larger

RESULTS

Socio-demographic features

The total of 95, out of 100 high school level students aged between 15-18 years with a mean age of 17.9 (+-0.2) years were completed and return the questionnaire and the response rate was 95%. There were 43 males and 52 females among the respondents.

Awareness of body use

Globally, students showed unsatisfactory awareness about doing a work in standing in front of table which is at their hip level and the true answer rate was 20% (Question 1). Eighty percent of students were aware on proper erect standing posture which the head up, shoulder blades back, knee straight and tucked stomach in (Question 2). According to the responses, 70% of the students were unaware the correct back discipline while washing clothes manually and 30% aware the correct posture of keeping washing clothes container on a bench which is at their hip level to reduce the stress on their back and knee (Question 3). Ninety-four percent of students were aware correct seating posture of sitting with back straight (hip and knee 90 degrees bent), shoulder back and buttock touching the back of the chair when they are seating in a high back rest chair (Question 4). Thirty-five percent of the respondents marked sitting with cross leg in a low back rest chair as correct which is an incorrect posture (Question 5). For the driving, correct posture of proper back support with knees at the same or higher than the hip level was marked by 90% of the respondents and ten percent gave incorrect marking (Question 6). Eighty-three percent of the respondents marked correct back discipline while gardening in kneeling posture (Question 7) and for the image of keeping a weight at a higher level, 88% of the respondents gave correct marking of use of bench or seat to get the height near to the object keeping level (Question 8). Nearly half of the students (48%) were unaware about proper back discipline of carrying one object by hold the object close to the body with arms bent (Question 9). Even though the great amount of students (94%) were aware on correct method of carrying two buckets (Question 10), more than half (52%) of the students do not aware the proper back pack carrying method of use of both shoulder straps (Question 11). Majority (77%) of the respondents marked the lying on back sleeping posture without head and knee support by a pillow as correct which is incorrect and twenty-three percent of the respondents were marked correct side lying posture with head supported by a pillow (Question 12). Ninety percent of the respondents were aware about correct mattress that should use for sleep (Question 13).

DISCUSSION

Back pain is a major musculoskeletal disorder⁹ which is evident not merely throughout older people, but also among youngsters. It may lead to a significant socioeconomic health issue, as a result of higher healthcare and sick leave cost¹⁰. This problem can certainly limit with teaching toward the balanced posture, body-function, ergonomic implications and activity patterns. This kind of ergonomics awareness instructional method has to commence at child years and should possibly be an integral part of their school curriculum³.

This study looked at the awareness of high school level students towards back disciplines in various daily activities. Majority of the respondents were unaware about correct back discipline when stand longer duration in front of a table at hip level (80%), manual washing (70%) and sleeping (77%). More than half of the respondents (52%) were unaware on correct back pack carrying discipline. Even though many respondents (88%) aware on correct method of keeping an object at a higher level, nearly half of the students (48%) were unaware about proper back discipline of carrying one object by hold the object close to the body with arms bent.

Carrying a school bag is a daily activity for most children and the recommended load limit to carry varies from 5%-20% of their body weight¹¹. Carrying overload may develop different symptoms of musculoskeletal disorders in upper back among children¹². Skoffer (1976) has identified that occurrence of low back pain among school children has a positive association of carrying school bag on one shoulder¹³. In our present study we have noticed that the level of awareness on correct back discipline of carrying back using two shoulders straps was low. This pattern of awareness was not similar with the study done by Puckree (2004) who reported that majority of the school students aware to carry the back packs over two shoulders¹⁴. This difference may be due to the current trend among school students, easiness of handling objects inside the back pack and crowd inside the public transport services. Under the sleeping method, the data was gathered about awareness on correct sleeping posture and mattress type. Seventy seven percent of the respondents marked lying on back without head supported on a pillow as the correct sleeping posture instead of proper side lying technique. This is not an optimal daily practice, which increase the unwanted muscle effort in neck and back lead to reduce the quality of life¹⁵.

In Karachi Pakistan most of the people involved in cloth washing by using manual techniques. But the awareness on correct manual method falls 30%. This is similar to the findings of research done by Oberoi (2007) which stated that during the manual method, most of women do not care about their posture¹⁶. The factor for the low level of accuracy in responses to this statement may be due to unfamiliarity on correct back disciplines and mental stress due to the heavy work load as a house wife.

The lack of awareness about back disciplines among high school level students is only tip of the iceberg. There exists a need to implement these facts by aggressive health education programs and group discussions. Instead of a glamorous approach, we want the mass media to create awareness and educate various aspects of back disciplines and body mechanics. We should encourage youngster in group discussions, interactive sessions and forums where all the doubts and aspects of back care discipline and its association with back injuries can be highlighted and clarified.

CONCLUSION

This study was designed to assess high school students' awareness on back care disciplines in various daily activities. This was found that awareness on correct postures of sitting, sleeping and carrying object was low and, exist gaps about awareness related to back disciplines in daily activities among youngster needed to be include in the school curriculum with a more integrated teaching.

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