

## The sitting posture of medical college students during examination period

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### Abstract

**Background and objective:** The posture during sitting has an impact on the incidence of back pain. In this study, an observation of the sitting posture among the medical students during examination period was studied.

**Methods:** Seventy seven students (F:M, 47:30) with a mean age of 23 years were involved. The type of the seat, height, weight of student, incidence of back pain, sports activities, gender and hand dominancy, in addition to the different types of posture were studied.

**Results:** Three types of posture were identified; straight, curved with contact to the back of the seat and curved without contact to the back of the seat. Neck side tilt was also observed. It was noticed that, short statured students sit straighter; however neck tilt was commoner in the left handed students. The majority of students adopt unhealthy sitting posture.

**Conclusion:** Attention has to be paid to the types of the seats made available to students. Seats with adjustable height and a design where there is a curve in the seat accommodating the pelvis would be helpful. Special seats for the left handed should be available. Education and sports activities should be highlighted.

**Keywords:** Posture, Students, Medical, Exam, Sitting.

### Introduction

Mechanical load during physiological movement will undoubtedly burden the skeleton; there is however, physiological counteraction, to adapt to this. During a good posture (proper positioning of the joint or skeleton), there will be a good recovery from the mechanical stress. This may however be hindered under undue stress which goes across a particular part of the skeleton when a bad posture is adopted. The lumbar spine is particularly prone to mechanical overburdening caused by adopting a bad posture of the spine.<sup>1</sup>Sitting is thought to be a common aggravating factor in low back pain (LBP), and re-education of sitting posture is a common aspect of LBP management.<sup>2-</sup><sup>4</sup>Some consider the ideal sitting posture to be with slight lumbar spine,<sup>1</sup> whereas others suggest a more lordotic posture.<sup>2-5</sup> We continue to debate these issues and as

yet, no solid data is available about the ideal posture, and the relation of non-ideal posture in giving rise to lower back pain or in the aggravation of an already existing degenerative lower lumbar spine disease. The aim of the current study is to check on the sitting posture of otherwise fit young college students and try to find some links between different sitting postures and back pain. Low back pain is common in the adults, the current paper aimed at exploring some of the possible associated factors.

### Methods

An observational study was conducted on medical student's sitting posture during theoretical examination period in year 2012. The study was carried out in Kirkuk Medical School, Iraq. Students off sick and absent students were excluded. Seventy seven medical students (30 boys, 47 girls)

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were studied during two hours midterm exam. A self designed questionnaire (not previously validated) was used to collect what is thought to be factors possibly influencing the adoption of a particular posture. The following variables were studied; height, weight, dominant hand, gender, posture during the two hours exam (particularly the lumbar spine and the cervical spine), the presence or absence of back pain and the sport's activities of the students. The posture of the student was observed by looking at the side (right and left, unless sitting next to the wall), the front and the back of each student, every 30 minutes (3-4 times) and a particular type of the posture was labeled when the type of posture was recorded at least 3 times during the examination period. The mean height±SD of the students was 170±12.2 cm and the mean±SD weight was 72±6.7 kg. The posture was divided into type I where the lumbar spine was extended; type II with the lumbar spine straight, and type III where the whole trunk was flexed forwards as shown in Figure 1. The seats used were wooden and a writing mobile table situated on the right side of the chair was available (Figure 2). The height of the seat was 42 cm. All the seats were for the right handed, where the desk was situated on the right side with a hinge tilting upwards. Statistical analysis: An online statistical calculator was used to obtain the standard deviation and p value using (ADaMSOft – statistical package for statistical analysis).



Figure 2: wooden desks.

**Results**

The mean±SD age of the students involved in the current study was 23±1.14 (range 22 to 26). The mean height was 170 cm, with the mean weight of 72 kg. The male to female ratio was 1:1.5 (77 students). Sixty nine students were right handed and eight left handed. There were two types of seats. Three types of sitting posture were identified, the neck position was curved forward for all, and however there was a side tilt and twist in 27 students. Significant neck and body tilt was common among the left handed students (seven students). This was due to the fact that the student were sitting on desks with right handed table and to twist their body around to use their left hand writing on right side table; very uncomfortable. Type I (35 students) sitting posture: Lumbar lordosis was preserved in this group. The mean height and weight of this group was smaller than the other types. Type II (36 students): the back was curved, however with some contact between the lumbar spine and the back of the seat. Patients were rather taller and heavier in this group. Type III (six students): in this group the spine was curved forward to the extent that there was no contact between the lumbar spine and the back of the seat.

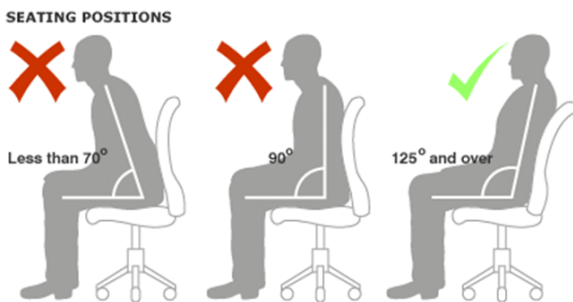


Figure 1: type I on the right, type II in the middle and type III on the left side<sup>6</sup>.

Table 1 shows the various postures and associated variables. Eleven students were playing occasional recreational sports (foot ball, basket ball, volley ball). There were 12 students with back discomfort. They were mainly among the type II posture, however; it was noticed that two left handed female students who play sports had back pain. Table 2 shows the characteristics of students in various posture groups.

### Discussion

Low back pain (LBP) is common among undergraduate students. In a study on the relation of mechanical back load and back pain, by Bakker et al.<sup>7</sup> on a total of 524 students who were followed for one year, 31% reported a new onset of LBP, of whom 31% reported persistent LBP.<sup>8</sup> Twelve among 77 medical students of Kirkuk Medical School studied in the current paper had pre-existing intermittent low back pain. Back pain in younger populations is thought to be related to posture and occupation. The relationship between spinal postures in general and back pain, however is unclear with poor evidence.<sup>8-11</sup>

The link between certain postures with a history of spinal pain is not directly studied.<sup>10-11</sup> A link between sitting at work and back pain is however, better evidenced.<sup>12</sup> Flexion (sitting, bending and driving) or sedentary activities, which probably implies flexion, were most commonly identified as aggravating factors for back pain; whilst postures of extension (walking and standing) were less commonly identified.<sup>3,13-15</sup> The number of hours, a bad posture adopted during sitting posture, seems to be proportionately associated with back pain. About 87% of Australians over 15 watch an average of more than three hours of television each day, added to this is sitting during transport to work and home.<sup>2</sup> There are no similar studies that have been conducted on participants of the similar age groups of this current study to compare the findings. The activities of sustained flexion dominate many peoples' every-day lives. It is therefore vital that the right posture is adopted to prevent the onset of back pain, in the younger generations. The current study tried to find out whether the sitting

**Table 1:** The various postures and associated variables.

Variable	Type I	Type II	Type III
Neck tilt	1	26	
Sex	F:M 23:12	21:15	3:3
Height	165(155-180)	172(160-180)	175(170-185)
Weight	70(65-80)	75(65-90)	68(75-109)
R:L handed	32:3	32:4	6
Back pain	2 F	8 (3F,5M)	2 (M)
Occasional Sports activities	2	4F, 5M	
p value	0.053	0.053	0.058

**Table 2:** Students with back pain.

Students with back pain	Mean Height (cm)	Mean weight (kg)	Right/Left handed	Sex F:M	Sports	p
Type I	170	70	1:1	2:0	2	0.68
Type II	175	75	7:1	3:5	2	0.57
Type III	170	74	2:0	0:2	0	0.68
Neck tilt	165	72	25:2	19:8	0	0.53

posture is adopted by medical students. It was noticed that the students with back pain were mainly adopting type II sitting posture. The sample size of this study was too small to conclude about the ideal sitting posture and the relation of different types of sitting postures with the development of back pain. Further studies in this field are recommended. It is clear from the current paper that playing sports is not commonly practiced among the medical students. Furthermore, the back posture was of a flexion type in more than half of our students. The latter factors may have a grievous impact in developing back pain among our future doctors. The left handed students were struggling with the seats during the exam because the desk was meant for the right hand and not the left. Those with back pain in our study were among the type II postures, and especially among the left handed. Ironically, left handed seats were available in our classes, however; they were not offered to the left handed students. This was because of ignorance of the issue. There are some limitations in the current paper. The small sample size, the limited studied associated factors, conflicting interpretation of different studies correlating low back pain and posture, and the definition of ideal posture, are some of these.

### Conclusion

There is no universal understanding on the ideal sitting posture which needs to be adopted during sitting. However, flexed spine, seems to be unfavourable in the current study. Further studies in the field are suggested.

### Conflicts of interest

The author reports no conflicts of interest.

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