

# Impact of Ergonomics on Undergraduate Physiotherapy Students in Bangladesh

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Received: November 26, 2024; Accepted: December 02, 2024; Published: December 07, 2024

## ABSTRACT

**Background:** Poor ergonomics is a global concern, contributing to musculoskeletal complaints mostly muscle imbalance, strain, and fatigue among university students due to abnormal posture.

**Purpose:** The purpose of the study was to identify the impact of ergonomics on undergraduate physiotherapy students in Bangladesh.

**Methodology:** The cross-sectional study was carried out from November 2021 to July of 2022. The convenience sampling technique was used to collect data from 210 undergrad physiotherapy students studying at different physiotherapy colleges or institute in Bangladesh. The modified ergonomics related self-questionnaire was used to explore the idea, knowledge and awareness about the correct posture, and the Numeric Pain Rating Scale (NPRS) was used to collect data about the severity of musculoskeletal pain. Data was collected through face-to-face interviews, and the Statistical Package for Social Sciences (SPSS) version 26.0 was used for analysis.

**Results:** The mean age  $\pm$  SD of the students was  $23.13 \pm 2.484$ . Out of 210 respondents, the majority of the respondents (54.8%) were males, and most of them from crowded area (50.5%). The most of the student's was Muslim (89.0%) while maximum were single (80.5%). The most of the students have to attend on the class in sitting posture up to 6-8 hours (69.5%) daily. The students have lack of postural awareness and forward bending is their preferred posture. The maximum participants (57.90%) had lower back pain, while 25.8% of had been prevented from doing their normal work due to pain. The results of the study showed a strong association between the study hours daily and correct sitting posture of the students ( $\chi^2 = 11.008$ ,  $df = 5$ , and  $p = 0.004$ ).

**Conclusion:** The study found that professional physiotherapy students have low ergonomics awareness and the benefits of its proper use. The preventive training and physiotherapy programs could effectively reduce musculoskeletal complaints among the undergraduate students.

**Keywords:** Ergonomics, Musculoskeletal Pain, Undergraduate, Physical Therapy

## Introduction

Ergonomics is a discipline focused on designing technology for efficiency, safety, and optimal human well-being. It aims to adapt

to human possibilities and needs, preventing strain injuries and long-term disability [1]. Currently, human focus is on common activities at work, school, or leisure, focusing on the relationship between a person and their environment [2]. Ergonomics is a multidisciplinary field that studies human anatomy, physiology, biomechanics, medicine, psychology, environmental science,

**Citation:** Salma Akter, Faruq Ahmed, Abdullah Al Mamun, Khadija Islam, Md Abdul Momin, et al. Impact of Ergonomics on Undergraduate Physiotherapy Students in Bangladesh. J Ortho Physio. 2024. 2(2): 1-6. DOI: doi.org/10.61440/JOP.2024.v2.14

management science, humanities, and engineering science [3]. It is an applied science that considers people's characteristics in designing and arranging things for effective and safe interaction [4]. Ergonomics helps understand work space, posture, seat, operation method, workload, safety, and information operator. It also provides design of management modes and size parameters for human industrial design [3].

According to a survey, Karachi medical and physiotherapy students have very little knowledge of ergonomics and the advantages of its initiatives. Prolong static sitting with awkward posture causes extra stress on the muscles, ligaments and bones of university students during studying, reading, doing lab works or assignments [5]. Inadequate ergonomics are a contributing factor to tiredness, physical imbalances, and strain. Incorrect ergonomics at workplace including working from home is not free from serious long-term health effects [6]. Computer use can cause kyphosis, forward head inclination, reduced blood flow to bones, muscles, ligaments, and tendons, leading to stiffness and pain [1]. Prolonged sitting among university students is linked to musculoskeletal pain, especially in the lower back. Understanding the link between study environment and ergonomic practices is crucial for reducing pain [7].

Musculoskeletal pain is a common issue in the workplace, often linked to poor ergonomic conditions. University students are more vulnerable to acute or chronic discomforts due to more predispose to ergonomic risks [8]. It is particularly challenging for young adults, as documented in studies in various countries, including China, Australia, India, Pakistan, and Brazil [9-13].

Poor ergonomics patterns are a global concern, leading to permanent or chronic impairments. Students often suffer from physical illnesses due to abnormal posture. But few studies focus on ergonomics impact in physiotherapy students. Incorporating ergonomics and workplace management in school curriculum is crucial. The purpose of this cross-sectional study was to identify the impact of ergonomics on undergraduate physiotherapy students in Bangladesh.

## Methodology

### Study Designs

The purpose of this cross-sectional study was to find out the impact of ergonomics on undergraduate physiotherapy students in Bangladesh. The convenience sampling technique was used to collect data from 210 participants. The undergrad physiotherapy students studying at different physiotherapy colleges or institute in Bangladesh constituted the study population for the present study.

### Study populations

The research was carried out from November 2021 to July of 2022. The selection of relevant and appropriate subjects for this study was aided by the researcher's consideration of eligibility criteria. Students who were regular in academic study of both genders had an age range between 18 to 30 years willingly participated in this study and met the inclusion criteria. The participants who had mentally disturbed were excluded from the study and who refused to participate in the study.

## Outcome Measurements

Data was collected by using a structural-type questionnaire. The survey was designed taking into account the characteristics and goals of the current investigation. The questionnaire had two basic sections. The first part contained questions on socio-demographic information. There was a questionnaire for acquiring the participant's demographic and study related information, including age, sex, religion, marital status, living area, study hours, comfort position, everyday class hours, class duration, break between two classes, and presentation overload of the students. The researcher collected data through an individual interviewing process in a calm environment.

In the second part the modified ergonomics related self-questionnaire was used to explore the idea, knowledge and awareness about the correct posture of the participants, and the numeric pain rating scale (NPRS) scale was used to collect data about the severity of musculoskeletal pain of the participants. The individual's level of pain was measured using the NPRS. It was used to ask patients to rate the severity of their present level of pain with an 11-point scale, with 0 representing no pain and 10 representing the greatest suffering possible [14].

## Data analysis

The collected data were inputted into a computer and analyzed using Statistical Package for Social Sciences (SPSS) version 26.0 and Microsoft Office Excel 2013. Categorical variables were presented as percentages and frequencies, and continuous variables as mean and standard deviation (SD), and the chi-square test was used to determine the level of significance between two or more variables. The null hypothesis was ruled out at the  $p < 0.05$  threshold for analysis. Before participating, patients got complete information about the research objectives and protocol and provided signed informed consent.

## Design and Ethics

The World Health Organization (WHO), the Bangladesh Medical Research Council's (BMRC), and Saic College of Medical Science & Technology's (SCMST) ethical standards were followed. Patients filled an informed consent form after being briefed on the objectives and methodology of the study. The study was approved by administrative bodies of the Ethical Review Board (ERB) and the Saic ethics committee. The registration number is ERB/SCMST/PT/4th-2016-17/040.

## Results

In this observational study, two hundred ten undergraduate physiotherapy students completed the survey. Almost each of the information required for the investigation is included. Almost each of the information required for the investigation is included in the study. The distribution of the participant's socio-demographic and study-related attributes is shown in Table 1. The mean age  $\pm$  SD of the participants was  $23.13 \pm 2.484$ . Of those who took part, 49.5% were between the ages of 19 and 21 years. Out of 210 respondents, the majority respondents (54.8%) were males, and most of them from crowded area (50.5%). The majority of the student's was Muslim (89.0%) while maximum was single (80.5%). The most of the students have to attend on the class in sitting 6-8 hours (69.5%) daily. The most of the student's class duration was 45-55 minutes (46.7%) and weekly 5 days (90.5%) to attend the class. The majority of the students

have lack of postural awareness and forward bending (57.6%) is their preferred posture. Due to long duration of class, they are not comfort in sitting posture (34.8%), besides they have presentation and assignment overloaded (71.4%).

**Table 1: Socio-demographic and Study related information of the respondents (n=210)**

| Demographic                        | %(n)              | Demographic                      | %(n)        | Demographic                  | %(n)        |
|------------------------------------|-------------------|----------------------------------|-------------|------------------------------|-------------|
| <b>Age</b>                         |                   | <b>Religion</b>                  |             | <b>Marital status</b>        |             |
| mean $\pm$ SD                      | 23.13 $\pm$ 2.484 |                                  |             |                              |             |
| 19-21 years                        | 49.5% (104)       | Islam                            | 89.0% (187) | Married                      | 19.0% (40)  |
| 22-25 years                        | 32.9% (69)        | Hindu                            | 9.0% (19)   | Unmarried                    | 80.5% (169) |
| > 25 years                         | 17.6% (37)        | Christian                        | 1.9% (4)    | Separated                    | 0.5% (1)    |
| <b>Gender</b>                      |                   | <b>Living area</b>               |             | <b>Feeling depression</b>    |             |
| Male                               | 54.8% (115)       | Crowded area                     | 50.5% (106) | Depressed                    | 56.7% (119) |
| Female                             | 45.2% (95)        | Peaceful area                    | 49.5% (104) | No depression                | 43.3% (91)  |
| <b>Study related information</b>   |                   |                                  |             |                              |             |
| <b>Everyday class hours</b>        |                   | <b>Sitting position</b>          |             | <b>Class duration</b>        |             |
| 3-5 hours                          | 16.7% (35)        | 3-5 hours                        | 7.6% (16)   | <45 minutes                  | 32.9% (69)  |
| 6-8 hours                          | 69.5% (146)       | 6-8 hours                        | 76.7% (161) | 45-55 minutes                | 46.7% (98)  |
| >8 hours                           | 13.8% (29)        | >8 hours                         | 15.7% (33)  | >55 minutes                  | 20.5% (43)  |
| <b>Study without class time</b>    |                   | <b>Posture without class</b>     |             | <b>Classes per week</b>      |             |
| <3 hours                           | 70.5% (148)       | Forward bending                  | 57.6% (121) | 5 days                       | 90.5% (190) |
| 3-6 hours                          | 28.1% (59)        | Backward bending                 | 18.5% (39)  | 6 days                       | 9.5% (20)   |
| >6 hours                           | 1.4% (3)          | Sitting up straight              | 23.8% (50)  |                              |             |
| <b>Comfort in sitting position</b> |                   | <b>Break between two classes</b> |             | <b>Presentation overload</b> |             |
| Yes                                | 34.8% (73)        | Yes                              | 43.3% (91)  | Yes                          | 71.4% (150) |
| No                                 | 65.2% (137)       | No                               | 56.7% (119) | No                           | 28.6% (60)  |

Table 2 showed that 36.7% participants had idea about ergonomics where 24.8% participants had knowledge about correct sitting ergonomics. The present study found an average pain score was 3.31 out of 10, according to the NPRS. This study showed the overall pain of the participants was 60.5%. Only 28.6% (60) participants have taken treatment for musculoskeletal discomfort while 26.67% taken medication, and 67.33% received physiotherapy interventions.

**Table 2: Ergonomics related information of the respondents (n=210)**

| Demographic                    | %(n)             | Demographic                          | %(n)        | Demographic                       | %(n)        |
|--------------------------------|------------------|--------------------------------------|-------------|-----------------------------------|-------------|
| <b>Idea about ergonomics</b>   |                  | <b>Feel pain</b>                     |             | <b>Correct sitting ergonomics</b> |             |
| Have idea                      | 36.7% (77)       | Feel pain                            | 60.0% (126) | Maintained                        | 24.8% (52)  |
| No idea                        | 63.3% (133)      | No pain                              | 39.5% (83)  | Not follow                        | 11.9% (25)  |
| <b>Severity of pain (NPRS)</b> |                  | <b>Source of ergonomics</b>          |             | <b>Sitting position in class</b>  |             |
| mean $\pm$ SD                  | 3.31 $\pm$ 1.043 | Academic                             | 36.2% (76)  | Forward banding                   | 61.0% (128) |
| < 3 mild                       | 33.3% (70)       | Journal                              | 63.8% (134) | Sitting up straight               | 29.5% (62)  |
| 3-5 moderate                   | 23.8% (50)       | Course                               | 0.5% (01)   | Back ward bending                 | 3.8% (08)   |
| > 5 severe                     | 2.4% (5)         | Others                               | 1.4% (03)   | Others                            | 5.2% (11)   |
| <b>Treatment for this pain</b> |                  | <b>Initiative to correct posture</b> |             | <b>Type of treatment</b>          |             |
| Taken                          | 28.6% (60)       | Initiate                             | 71.9% (151) | Medication                        | 26.67% (16) |
| Not taken                      | 31.9% (67)       | Don't initiate                       | 27.1% (57)  | Physiotherapy                     | 67.33% (44) |

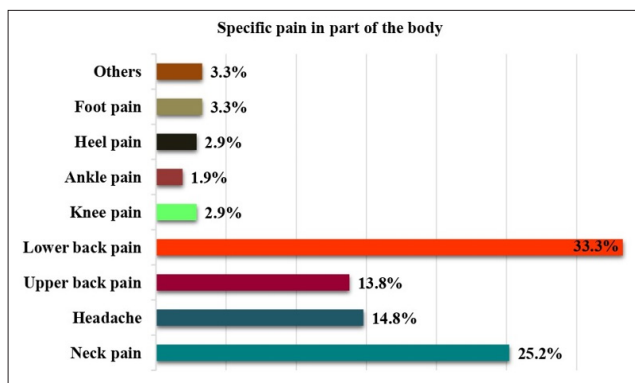
Figure 1 displayed that among the 210 participants there 25.2% students had neck pain, 14.8% had headache, 13.8% upper back pain, 33.3% had lower back pain, 2.9% had knee pain, 1.9% had ankle pain, 2.9% had heel pain, 3.3% had foot pain, and 3.3% had others pain in specific part of the body. This study explored that lower back pain has a high morbidity, next to neck pain and headache.

Table 3 represents the association between the study or class hours and correct sitting posture of the students. The study showed that, out of 210 participants, the maximum 134 (63.81%) students didn't follow the correct sitting posture and it is meant that they were not properly aware about the postural education. The results of the study showed a strong association between the study hours

daily and correct sitting posture of the students ( $\chi^2 = 11.008$ ,  $df = 5$ , and  $p = 0.004$ ).

**Table 3: Association between study hour and correct sitting posture**

| Study or class hours daily | Correct sitting posture n (%) |              | $\chi^2$ | df | P value |
|----------------------------|-------------------------------|--------------|----------|----|---------|
|                            | Maintain                      | Unaware      |          |    |         |
| 3-5 hours                  | 17 (22.37%)                   | 18 (13.43%)  | 11.008   | 5  | 0.004   |
| 6-8 hours                  | 56 (73.68%)                   | 90 (67.16%)  |          |    |         |
| >8 hours                   | 3 (3.95%)                     | 26 (19.40%)  |          |    |         |
| Total                      | 76 (36.19%)                   | 134 (63.81%) |          |    |         |



**Figure 1: Specific pain in part of the body of the participants**

Table 4 represents the association between the study or class hours and correct sitting posture of the students. Among 210 participants, the majority 92 (43.81%) students felt pain in the neck and 118 (56.19%) had no pain in the neck. The association between the study or class hours and pain the neck of the students was found statistically significant ( $\chi^2 = 11.628$ ,  $df = 6$ , and  $p = 0.020$ ).

**Table 4: Association between study hours and pain in the neck of the students**

| Study or class hours daily | Pain in the neck n (%) |              | $\chi^2$ | df | P value |
|----------------------------|------------------------|--------------|----------|----|---------|
|                            | Feel pain              | No pain      |          |    |         |
| 3-5 hours                  | 16 (17.39%)            | 22 (18.64%)  | 11.628   | 6  | 0.020   |
| 6-8 hours                  | 66 (71.74%)            | 81 (68.64%)  |          |    |         |
| > 8 hours                  | 10 (10.87%)            | 15 (12.71%)  |          |    |         |
| Total                      | 92 (43.81%)            | 118 (56.19%) |          |    |         |

## Discussion

The cross-sectional study's purpose was to analyze the impact of ergonomics on physiotherapy undergraduate students in Bangladesh. The relevant data were collected from a sample

of 210 undergrad physiotherapy students studying at different physiotherapy in Bangladesh. In the current study, the mean age  $\pm$  SD of the respondents was  $23.13 \pm 2.484$ . It revealed that the majority (49.5%) of students belonged to the age group of 19 to 21 years, and 32.9% of students were in the age group of 22 to 25 years. In a similar study in Pakistan, the majority of the participants, 73.0% were in the age range of 20 to 25 years [15]. Out of 210 respondents, the majority respondents (54.8%) were males, while maximum were single (80.5%). In another study, the male participants (57.8%) were more than females (42.2%). It was identified that most of the respondents were married (85.7%) [16].

The present study revealed that the majority 77 (36.7%) of participants were reported idea about ergonomics. It also found that idea of ergonomics was not significantly associated with gender ( $p = 0.164$ ). A study reported that, 27 (25.5%) of respondents heard of the term ergonomics. The study observed a significant association between awareness of ergonomics and gender of the participants ( $p = 0.02$ ) [17]. Another study observed that only 28.6% were aware of the ergonomics but 82% of admitted to have knowledge of body posture [18].

The most of the students have to attend on the class in sitting posture 6-8 hours (69.5%) daily. The mean study hours and standard deviation of the participant was  $6.42 \pm 1.015$ . A study explored nearly one thirds of the students (39.9%) used to work for 6 hours or less daily and two thirds of the students (60.1%) used to work for 6 hours or more daily [19]. This survey showed that among the 210 participants there only 36.2% were correct sitting posture in classroom and 63.8% were no correct sitting posture in classroom. Another survey identified among a total of 336 participants, there were only 28.6% of the students were found to sit correctly in the dentist chair [20].

In this study showed that 36.7% participants had idea about ergonomics where 24.8% participants had knowledge about correct sitting ergonomics. One survey recognized a relation between the poor sitting posture and neck pain during long study hours. The results also observed that poor sitting posture is not the only reason of neck pain; there are other influencing factors as well. More than 71% of students are aware about the correct sitting posture during academic hours [21]. The present study found an average pain score was 3.31 out of 10, according to the NPRS. The most common was identified in the lower back (33.3%), neck (25.2%), headache (14.8%), and upper back (13.8%). According to McQuivey (2021), there found an average pain scores 3.52/10. The most frequently reported significant discomfort was in the lower back (35%), neck (29.7%), and feet (25.7%) [22].

This study showed the overall pain of the participants was 60.5%. The prevalence of pain among male were 30.9% (65) while female was 29.1% (61). The most common sites of pain were the lower back 33.3%, neck 25.2%, headache 14.8%, upper back 13.8%, knees and heel 2.9% and foot 3.3%. A related study explored that the overall musculoskeletal disorders (MSDs) was 87.3%. The prevalence of MSDs was 95.3% in women and 81.4% in men. The most common sites of MSDs were the lower back 62.55%, neck 36.25%, knees 41.04%, and ankle 37.05%. The most common site of MSDs among male was the lower

back (57.9%), where female was the lower back (68.9%). So, it is observed that females are more affected than males [16].

This study explored that lower back pain (33.3%) has a high morbidity, next to neck pain which is affecting approximately 25.2% in which females have higher prevalence rate 14.2% than males 11%. A study observed that, cervicogenic pain has a high morbidity, next to backache which is affecting approximately 70% of general population in which females have higher prevalence rate (6.5%) than males (4.2%) [21].

The results of the study showed a strong association between the study hours daily and correct sitting posture of the students ( $\chi^2 = 11.008$ ,  $df = 5$ , and  $p = 0.004$ ). The association between the study or class hours and pain the neck of the students was found statistically significant ( $\chi^2 = 11.628$ ,  $df = 6$ , and  $p = 0.020$ ). In a related study a significant association was found between musculoskeletal discomfort and training on ergonomics ( $p = 0.05$ ) [23]. Another study identified a significant association between the knowledge about ergonomics and musculoskeletal pain among the respondents [8].

### Limitation

The limited number of sample sizes and shortened duration of the study - these limitations should be noted. The measurement technique has another drawback. The sample was collected from a few physiotherapy colleges, which doesn't represent the generality of the findings. It is another limitation of the study. Further research is recommended to investigate a large sample. It is also strongly recommended to increase the sample size to generalize the result in all the undergraduate students.

### Conclusion

The study revealed a significant lack of ergonomics awareness among professional physiotherapy students, indicating a lack of understanding of the benefits of proper ergonomics use. Students and parents were not aware of ergonomics and working habits. Ergonomics and workplace management must be included immediately in their curriculum, parents and teachers need to be training in the subject. The study highlights the prevalence of musculoskeletal pain among students, which is linked to study hours, depression, and academic stress. It suggests that preventive ergonomic training and physiotherapy programs could help reduce these issues.

### Acknowledgments

The authors would like to appreciate the department of physiotherapy of the reputed organizations for their coordination and great collaboration. The authors would also like to thank to all the participants sincerely.

### Ethical consideration

Every ethical principle was addressed in the article.

### Author contribution

Each author made an equal contribution to the article's preparation.

### Conflict of interest

Regarding the publishing of this research, the authors disclosed no conflicts of interest.

### Funding

There was no financial support to share.

### References

- Salman M, Bettany-Saltikov J, Kandasamy G, Whittaker V, Hogg J, et al. PROTOCOL: The effect of education programmes for improving knowledge of back health, ergonomics and postural behaviour in university students: A systematic review. *Campbell Systematic Reviews*. 2022. 18: 1213.
- Lipoldová M, Hitka M, Sedmák R, Kolena B, Jambal T. Secular trends of adult population and their impacts in industrial design and ergonomics. *Applied Sciences*. 2020. 10: 7565.
- Pi J. Effect of Ergonomics-Based Piano Teaching on Teachers' Physical and Mental Health and the Improvement of Sense of Happiness. *J Healthc Eng*. 2022. 2022: 9174441.
- Smallwood JJ, Haupt TC. Construction ergonomics: Perspectives of female and male production workers. In *25th Association of Researchers in Construction Management Conference*. 2009. 1263-1271.
- Farooqui SI, Khan AA, Rahim M, Rafiq N, Farhad A. Analyzing spinal curves for prolong sitting in university going students. *J Eur Ceram Soc*. 2015. 4: 58-65.
- Choudhary MB, Choudary AB, Jamal S, Kumar R, Jamal S. The impact of ergonomics on children studying online during COVID-19 lockdown. *Journal of Advances in Sports and Physical Education*. 2020. 3: 117-120.
- Kuč J, Žendzian-Piotrowska M. Evaluation of the Cervical Physiotherapeutic Treatment Needs, Work Ergonomics, and Necessity for Physical Activity Among Students of Dentistry at a Medical University. A Pilot Study. *Front Psychol*. 2020. 11: 559657.
- Siy W, Sicat ZM, Bautista TM, Formalejo A, Gatdula ME, et al. Correlational study of ergonomic knowledge and level of MSK discomfort during online classes of 1st-4th year UST-CRS physical therapy students: a cross-sectional study. *BMJ open*. 2023. 13: 076259.
- Smith DR, Wei N, Ishitake T, Wang RS. Musculoskeletal disorders among Chinese medical students. *Kurume Med J*. 2005. 52: 139-146.
- Smith DR, Leggat PA. Prevalence and distribution of musculoskeletal pain among Australian medical students. *J Musculoskelet Pain*. 2007. 15: 39-46.
- Aggarwal N, Anand T, Kishore J, Ingle GK. Low back pain and associated risk factors among undergraduate students of a medical college in Delhi. *Educ Health*. 2013. 26: 103-108.
- Hasan MM, Yaqoob U, Ali SS, Siddiqui AA. Frequency of musculoskeletal pain and associated factors among undergraduate students. *Case Rep Clin Med*. 2018. 7: 131-145.
- Morais BX, Dalmolin GD, Andolhe R, Dullius AI, Rocha LP. Musculoskeletal pain in undergraduate health students: prevalence and associated factors. *Rev Esc Enferm USP*. 2019. 53: 03444.
- Young IA, Dunning J, Butts R, Mourad F, Cleland JA. Reliability, construct validity, and responsiveness of the neck disability index and numeric pain rating scale in patients with mechanical neck pain without upper extremity symptoms. *Physiotherapy Theory and Practice*. 2019. 35: 1328-1335.

15. Hussain HM, Khanzada SR, Khan K, Memon AU, Feroz J, et al. Awareness of good posture and computer ergonomics among medical students of ISRA University. *Int J Physiother*. 2015. 2: 987-991.
16. Althomali OW, Amin J, Alghamdi W, Shaik DH. Prevalence and factors associated with musculoskeletal disorders among secondary schoolteachers in Hail, Saudi Arabia: A cross-sectional survey. *Int J Environ Res Public Health*. 2021. 18: 6632.
17. Oladeinde BH, Ekejindu IM, Omoregie R, Aguh OD. Awareness and knowledge of ergonomics among medical laboratory scientists in Nigeria. *Ann Med Health Sci Res*. 2015. 5: 423-427.
18. Sarfraz M, Kashmala FS, Anees S. Awareness of ergonomics among the physiotherapy and medical students. *Pakistan J Rehabil*. 2013. 2: 31-37.
19. El-Sallamy RM, Atlam SA, Kabbash I, El-fatah SA, El-Flaky A. Knowledge, attitude, and practice towards ergonomics among undergraduates of Faculty of Dentistry, Tanta University, Egypt. *Environ Sci Pollution Res*. 2018. 25: 30793-30801.
20. Cervera-Espert J, Pascual-Moscardó A, Camps-Alemany I. Wrong postural hygiene and ergonomics in dental students of the University of Valencia (Spain)(part I). *Eur J Dent Educ*. 2018. 22: 48-56.
21. Khan AA, Farooqui SI, Omar Z. The Association of Sitting Posture and Cervicogenic Pain among the Students of Physical Therapy. *Pakistan J Rehabil*. 2012. 1: 28-31.
22. McQuivey KS, Deckey DG, Christopher ZK, Rosenow CS, Mi L, et al. Surgical ergonomics and musculoskeletal pain in orthopaedic surgery residents: a multicenter survey study. *JAAOS Global Research and Reviews*. 2021. 5: 20.
23. Dalkilinç M, Bumin G, Kayihan H. The effects of ergonomic training and preventive physiotherapy in musculo-skeletal pain. *Pain Clinic*. 2002. 14: 75-79.