

Knowledge and Practice of Laptop Ergonomics in Office Employees

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ABSTRACT

Background: The rapid growth of information technology has led to increased laptop usage in offices, industries, and educational settings. However, the lack of knowledge and practice of ergonomics during laptop use can result in musculoskeletal discomfort and constrained postures. It is important to provide information to frequent laptop users about the ergonomics effects to prevent musculoskeletal disorders.

Objective: Study is aimed to access knowledge and practice level of laptop ergonomics among office employees.

Methodology: The following descriptive study was conducted on a sample size of 195 employees calculated through Rao-soft software. Data was collected by using convenient sampling technique from two private and one government office setting operating in Lahore, Pakistan, using a questionnaire assessing knowledge and practice of laptop ergonomics among office employees. Employees fulfilling the eligibility criteria were encouraged to fill the questionnaire after informed consent.

Result: 195 employees with mean age 29.892±8.008 participated in this study. 75.9% had fair knowledge of laptop ergonomics and 59.6% employees practice this moderately. 12.3% participant had good knowledge of laptop ergonomics out which only 7.2% have good practice of laptop ergonomics while 11.8% population had poor knowledge and 33.3% had poor laptop ergonomic practice.

Conclusion: More than half of the office employees are well known with knowledge of laptop practice but they don't practice ergonomics in daily work routine. Workplace administrations should design offices based on ergonomic principles to prevent musculoskeletal disorders. Education programs and seminars on laptop ergonomics can raise awareness among employees.

Keywords: Knowledge and practice, laptop ergonomics, office employees

INTRODUCTION

Among developing countries Pakistan is heading towards industrialization and as a result increasing number of people connected to information technology, thus increased laptop use⁽¹⁾. Laptop was launched as a substitute to fulfill the needs of office employees. Laptops were not actually launched to overcome the desktop computers or to be used for prolonged time period⁽²⁾.

Ergonomics aims to create a user-friendly workplace, products, and systems that fit the users' needs^(3, 4), reducing the need for users to adapt to their workstations. However, the lack of knowledge and practice of ergonomics has led to a 25% increase in musculoskeletal disorders (MSDs)^(5, 6). This lack of ergonomics can result in fatigue, discomfort, neck pain, and other symptoms⁽⁷⁾. In America, half of the adult population owns a laptop, while in Australia, there is a significant number of laptop users (63%)⁽⁸⁾.

According to a study fifty one point eight percent (51.8%) people use their laptop computer for one to four hours per day⁽⁵⁾. Laptop is considered as an essential component in office work. With benefits, laptop are carrying hazards in prolong use. Repetitive and sensitive task like accounting and finance shifts to long working hour thus impairing musculoskeletal system of office employees. As employee is no more restricted to a work station, he can perform tasks other than the job (lunch, private call, internet surfing, social media). Thus, develops various work related musculoskeletal disorders (WRMSDs)⁽⁹⁾.

Musculoskeletal disorders (MSDs) are a common concern among office employees. These disorders affect the muscles, tendons, ligaments, nerves, and other soft tissues, causing pain, discomfort, and reduced functionality. Office employees are particularly susceptible to MSDs due to prolonged sitting, repetitive movements, poor posture, and inadequate ergonomic setups⁽¹⁰⁾.

The risk factors for MSD of the upper extremity and neck can be divided into three basic categories. Firstly, individual factors (including age, gender, obesity, physical activity, smoking, use of vision correction and inherent psychological states). Secondly,

exposure to physical workstation design and task demands such as computer use duration, number of breaks, method of operating keyboard, position of display screen, type and use of input devices have been linked with MSD. Finally, psycho social factors of workplace are considered to play a vital role in the developing MSD^(11, 12).

A conducted states that eighty five percent (85%) of their office workers have not received training before and forty four percent (44%) had complaint of pain or stiffness. Follow up survey revealed that those participants who made ergonomic office changes got rid of pain or stiffness which they had experienced before⁽¹³⁾. Knowledge and practice of ergonomics can help to overcome all these difficulties and enhances anticipated outcomes⁽¹⁴⁾.

Current study aimed to access knowledge and practice level of laptop ergonomics among office employees. This study will help to access and improve the knowledge and practice of laptop ergonomics among office employees. It will be helpful for creating awareness, identifying areas for improvement, and implementing effective strategies to promote a healthy and ergonomic work environment. By prioritizing laptop ergonomics, organizations can foster a culture of well-being, productivity, and long-term success.

METHODOLOGY

Study Design: This was a descriptive cross-sectional study.

Study Settings: The data was collected from different office employees in Lahore mainly bankers, software houses, workers at Nestle limited and Water aid (NGO)

Sample Size: Sample size of 195 employees was calculated by using Rao-soft sample size calculator at 90% confidence interval, 5% margin of error and 85% response distribution rate.

Sampling Technique: Convenient sampling technique was used.

Time Duration: Study was completed in three months after the approval of synopsis.

Eligibility Criteria

Inclusion Criteria:

- Employees using laptop 18 hours/week.
- Both male and female.
- Employees having their own laptop. ⁽¹⁵⁾

Exclusion Criteria:

- Employees diagnosed musculoskeletal disease.
- Employees not fulfilling the above mentioned criteria.

Data Collection Procedures: This descriptive cross-sectional study was conducted on a sample size 195 office employees, calculated using Rao-soft software through convenient sampling technique. Data was collected from different different private office setting operating in Lahore, Pakistan, mainly banks, software houses, Nestle limited and Water aid (NGO) using a questionnaire assessing knowledge and practice of laptop ergonomics among office employees. Approximately 300 employees were reached but those fulfilling the eligibility criteria were encouraged to fill the questionnaire after informed consent. SPSS version 25 was used for data analysis. Frequencies and percentages were calculated for the qualitative data

RESULTS

The mean age of office employees included in the study was 29.892 ± 8.008 , while the minimum age was 21 years and maximum was 58. of 195 participants 160 (82.1%) were male and 35 (17.9%) were females. Majority of the participants (149, 76.4%) belonged to middle class while 11 (5.6%) belonged to lower class. 131(67.2%) participated in physical activity in their leisure time while 97 (49.7%) reported to have good physical health while 83 (42.6%) reported their physical health as fair. (Table 1)

Table 1: Demographic Data

Variable		Frequency n=195	Percentage
Gender	Male	160	82.1%
	Female	35	17.9%
Socioeconomic Status	Upper Class	35	17.9%
	Middle Class	149	76.4%
	Lower Class	11	5.6%
Overall Physical health	Poor	10	5.1%
	Fair	83	42.6%
	Good	97	49.7%
	Excellent	5	2.6%

Table 2: Peculiarities about laptop Usage

Variable		Frequency n=195	Percentage
Length of Laptop usage	1-4 years	33	16.9%
	5-8 years	121	62.1%
	9-12 years	32	16.4%
	13-16 years	7	3.6%
	17-20 years	2	1.0%
Laptop usage hours per day	1-5 hours	51	26.2%
	6-10 hours	135	69.2%
	11-15 hours	9	4.6%
Breaks while using laptop	No break	17	8.7%
	5-10 minutes	66	33.8%
	11-20 minutes	63	32.3%
	20-30 minutes	49	25.1%
Laptop Workstation Setup	Sitting with laptop on desk	180	92.3%
	Lying Supine	0	0
	Lying Prone	0	0
	Floor Sitting	10	5.1%
	Chair Sitting	5	2.6%
	Sitting with laptop in Lap	0	0

121 (62.1%) participants has been using laptop since 5-8 years and 33 (16.9%) reported to use laptop since 1-4 years. About 135 (69.2%) office employees reported that their laptop usage hours were 6-10 hours per day while 51 (26.2%) used laptop for 1-5 hours per day. Meanwhile 66 (33.8%) took 5-10 minutes break from laptop and 63 (32.3%) employees took rest for 11-20 minutes during laptop usage hours. As all the participants were office employees so 180 (92.3%) worked while sitting with a

laptop on desk and 10 (5.1%) worked on floor sitting. About 142 (72.8%) used laptops in the office while 49 (25.12%) used laptops in the conference room or meeting room. (Table 2)

Regarding the knowledge of Ergonomics, of 195 only 24 (12.3%) had good knowledge while 148(75%) rated their knowledge about ergonomics as fair, and of them only 14 (7.2%) practiced that knowledge at their workplace at good rate while 116(59.5%) fairly practiced ergonomics. (Table 3)

Table 3: Laptop Ergonomics

Variable		Frequency n=195	Percentage
Overall Knowledge Rating of Ergonomics	Poor	23	11.8%
	Fair	148	75.9%
	Good	24	12.3%
Overall Practice Rating of Laptop Ergonomics	Poor	65	33.3%
	Fair	116	59.5%
	Good	14	7.2%

DISCUSSION

Laptop is an integral part of office employees these days. Although work efficiency has been improved with their usage in all settings especially in offices, it demands proper positioning otherwise it creates havoc for upper body. There are some ergonomic issues associated with frequent long term use of laptops if not tackled properly can bring permanent MSDs and posture abnormalities which ultimately decreases the work efficiency of employees.

A study conducted in Karachi in 2012 to assess the knowledge and practice of ergonomics shows slightly different results as compared to our study where maximum (92%) people were aware of significance of ergonomics but half of the participants didn't practice ergonomics. About 54% participants had been using computer for more than 10 years and 54.65% used computer for 4-5 hours daily practice proper ergonomics on daily basis.⁽¹⁵⁾ while according to the results of current study 121 (62.1%) had been using laptop for 5-8 years and 135 (69.2%) used laptop for about 6-10 hours daily.

A study conducted in 2022 about the knowledge and practice of laptop ergonomics in students studying at private universities of Lahore, the study concluded that about 50% students had knowledge about ergonomics but only a little percentage of them applied that knowledge in daily routine. The following results are consistent with the current study where about 148(75%) had fair knowledge and only 14 (7.2%) practised ergonomics⁽¹⁶⁾.

Another study was conducted in Malaysian University students in 2016, where knowledge of laptop ergonomics was compared with the [prevalence of MSK symptoms. The results regarding knowledge and practice were similar to current study where about 74.1% were knowledge scores and 70% were practice scores⁽⁷⁾.

A study conducted in 2019 about the knowledge of ergonomics among employees showed similar results as that of current study. According to previous study 65% of the individuals had knowledge about computer ergonomics while 83(69.2%) took break for at least 30 minutes from computer and 85 (70.8%) took eye break from laptop screen mean while⁽¹⁷⁾, in the current study 135 (69.2%) used laptop for about 6-10 hours daily and took rest while 66 (33.8%) employees took rest for 5-10 minutes and 63 (32.3%) took rest for 11-20 minutes averagely.

CONCLUSION

More than half of the office employees are well known with knowledge of laptop practice but still not all of them practice ergonomics while using laptops for prolong periods. Administration of such working place should design office according to ergonomic principles to prevent maximum musculoskeletal disorders and wide education program and seminars should be conducted regarding laptop ergonomics for awareness.

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