

## Awareness and Health Outcomes Related to Ergonomic Practices Amid Digital Transformation: A Survey of Remote Workers in Islamabad, Pakistan

Minnah Hafeez<sup>1</sup>, Shamseen Dara<sup>1</sup>, Ayesha Khalid<sup>1</sup>, Tahreem Tanweer<sup>1,2</sup>, Sidra Shahid<sup>1</sup>

1. Humanities and Social Sciences Department, Bahria University, E-8 Campus, Islamabad, 44000, Pakistan
2. Department of Biomedical Engineering and Sciences, School of Mechanical and Manufacturing Engineering, National University of Sciences and Technology (NUST), Islamabad, 44000, Pakistan

### INTRODUCTION & AIM

The rapid digital transformation accelerated by the COVID-19 pandemic has significantly altered global work dynamics, with work-from-home (WFH) becoming increasingly prevalent [1]. Work-from-home in Pakistan has grown rapidly, increasing from 3.59 M to 4.37 M workers in last five years [2]. While remote work offers flexibility, it introduces significant ergonomic risks [3].

**Aim and Objective:** This study aimed to assess the understanding and implementation of ergonomic principles among remote employees in Islamabad and to evaluate how WFH practices affect their physical and mental well-being.

### METHOD

**Study type:** A cross-sectional online survey was conducted among remote workers in Islamabad, Pakistan (N = 34).

**Sampling Method:** Participants were recruited through nonprobability snowball sampling.

**Data Collection Technique and Variables:** A structured, content-validated questionnaire covering demographics, ergonomic awareness, workstation practices, and health symptoms was distributed via social media platforms and professional networks. Informed consent was taken from each participant before data collection.

**Data Analysis:** Descriptive statistics, including frequencies and percentages, were analyzed using SPSS version 18. Fisher's exact test was applied to examine associations between workstation deficiencies and reported symptoms.

### RESULTS & DISCUSSION

#### Demographic characteristics

Most participants (82.4%) were female, and 58.8% were aged 20–25 years.

**Awareness:** More than half of the participants (57%) were familiar with the concept of ergonomics, however practical implementation remained poor (Figure 1).

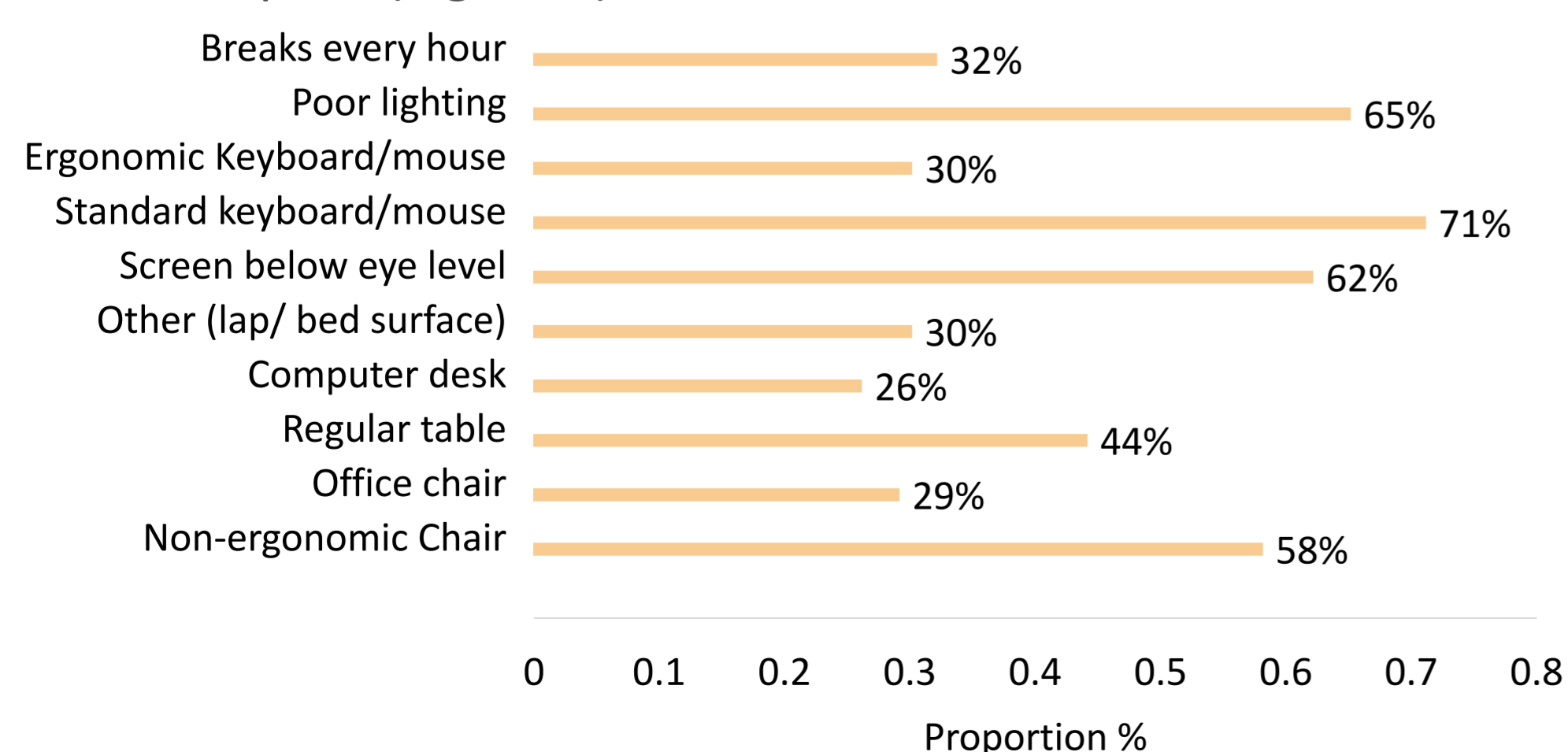


Figure 1. Distribution of chair type, desk type, screen height, keyboard/mouse setup, lighting condition, and frequency of breaks among remote workers (n=34) in Islamabad Pakistan

**Ergonomic Practices:** The findings revealed substantial ergonomic shortcomings: 58% used non-ergonomic chairs, 44% worked on non-ergonomic tables, and 62% placed their screens below eye level. Only 32% participants took regular hourly breaks, indicating limited adoption of basic ergonomic practices (Figure 1).

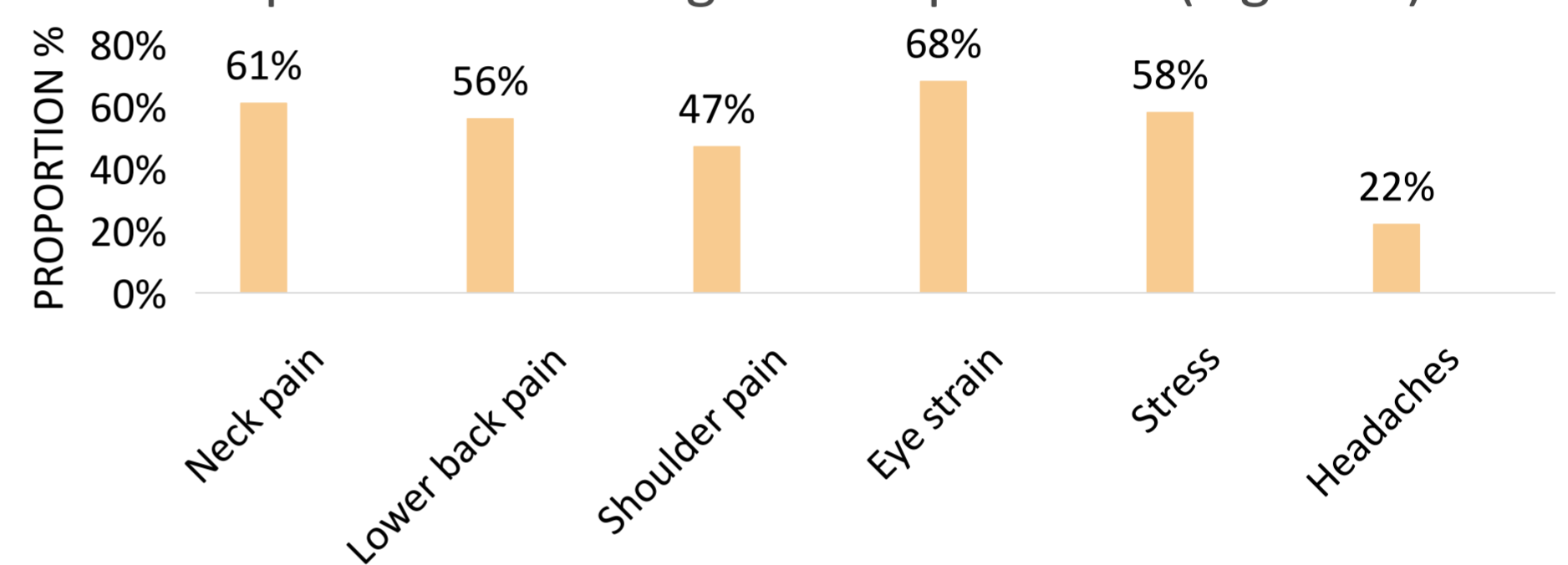


Figure 2. Reported health impacts observed including prevalence of musculoskeletal pain, eye strain, fatigue, and stress among respondents (n=34).

**Physical and Mental Health Issues Observed:** These setups contributed to notable health issues: 61% experienced constant neck pain, 56% reported lower back pain, and 47% had shoulder discomfort. Additionally, 68% reported eye strain, whereas more than half experienced fatigue and stress (Figure 2).

**Associations between Workstation Deficiencies and Reported Symptoms.** Fisher's exact test showed no statistically significant association between symptoms and desktop level ( $p = 0.34$ ), keyboard position ( $p = 1.1$ ), chair type ( $p = 0.310$ ), or desk type ( $p = 0.366$ ).

### CONCLUSION

Despite growing awareness of the challenges of remote work, ergonomic practices among Islamabad's remote workforce remain limited. The high burden of discomfort underscores the need for affordable workstation improvements.

### FUTURE WORK

Future studies with larger samples and longitudinal or interventional designs are recommended to clarify causal relationships between workstation design and health outcomes.

**Conflict of Interest Statement:** There was no conflict of interest to disclose.

**Funding information:** There is no funding source to disclose.

### REFERENCES

1. Florence Bonnet, Françoise Carré, Martha Chen and Joann Vanek. weigo statistical brief on home based workers. Accessed: Oct. 11, 2025. <https://www.ilo.org/publications/home-based-workers-world-statistical-profile>
2. IEA (International Ergonomics and Human Factors Association). <https://iea.cc/about/what-is-ergonomics/>
3. S. Shafique, T. Shahzadi, R. Najam, and N. Muneed, 'Effects of Critical Components of Home Office on Ergonomics of Workers during COVID-19 Pandemic'. Pakistan Journal of Medical Research, May 05, 2023. [Online]. Available: <https://pjmr.org.pk/index.php/pjmr/article/287>