

Webinar-Based Health Education on Ergonomic Posture as a Promotive and Preventive Strategy for Musculoskeletal Disorders

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ABSTRACT

Musculoskeletal disorders are among the most common health problems resulting from non-ergonomic body posture habits during daily activities, particularly among individuals of productive age. Health education plays an important promotive and preventive role in efforts to prevent musculoskeletal disorders. This community service activity aimed to provide education on ergonomic body posture as a promotive and preventive strategy against musculoskeletal disorders through a webinar. The activity was conducted in the form of a webinar featuring dr. Maulana Hasymi Hutabarat, Sp.OT, as the keynote speaker. The material was delivered through an educational presentation followed by an interactive discussion session on the application of ergonomic body posture in daily activities. Participants included students of Sultan Ageng Tirtayasa University (UNTIRTA) as well as members of the general public from various institutional backgrounds. The implementation of the activity demonstrated active participant engagement, particularly during the discussion and question-and-answer sessions. This community service activity is expected to enhance participants' understanding and awareness of the importance of applying ergonomic body posture and to contribute to promotive and preventive efforts against musculoskeletal disorders.

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INTRODUCTION

Musculoskeletal disorders represent one of the major health problems with broad impacts on physical function, productivity, and overall quality of life. The World Health Organization emphasizes that musculoskeletal disorders, including low back pain and spinal disorders, are the leading causes of disability globally and contribute significantly to the burden on healthcare systems worldwide (World Health Organization, 2022). Data from the Global Burden of Disease further indicate that low back pain is among the musculoskeletal conditions with the highest prevalence and is projected to continue increasing in disease burden through 2050 (GBD 2021 Low Back Pain Collaborators, 2023; Chang et al., 2024).

One of the key factors contributing to the development of musculoskeletal disorders is the habitual adoption of non-ergonomic body postures during daily activities. Dysfunction of the back muscles due to improper posture may trigger chronic low back pain and other functional impairments (Matheve et al., 2023). Numerous studies have shown that non-ergonomic sitting positions, prolonged sitting duration, and excessive use of digital devices are closely associated with the occurrence of low back pain and musculoskeletal complaints in both children and adults (Marcello, 2024; Alifia & Putri, 2023).

University students represent a population particularly vulnerable to musculoskeletal disorders, mainly due to prolonged sitting during academic activities and technology-based learning environments. Research has reported a high prevalence of musculoskeletal disorders among students, including medical students, influenced by ergonomic factors, learning styles, and daily postural habits (Ramos & Godoy, 2025; Mann & Verma, 2025). Furthermore, distance learning has been reported to increase the risk of musculoskeletal disorders as a result of poorly arranged and non-ergonomic study workstations (Edwar et al., 2020).

Health education plays a strategic role in promotive and preventive efforts by increasing awareness and encouraging behavioral change related to musculoskeletal health. Educational approaches focusing on ergonomic posture have proven to be relevant across various age groups, including school-aged children and university students, as part of preventive strategies against back pain and spinal disorders (Erika et al., 2022; Cahyaningrum et al., 2025). Such educational efforts align with the concept of health literacy, which emphasizes individuals' ability to access, understand, evaluate, and apply health information in daily life (Nutbeam et al., 2018). Moreover, scientific evidence highlights education as a critical component in the management and prevention of musculoskeletal disorders, including shoulder pain and low back pain (Zhang et al., 2025).

Along with advances in information technology, health education can be effectively delivered through online platforms such as webinars. E-learning and webinar-based education are considered capable of reaching a wide audience in a flexible and interactive manner, despite certain implementation challenges (Regmi & Jones, 2020). Several community service initiatives have demonstrated that webinars can serve as effective tools for health promotion and the dissemination of health education to the public (Nurfadhilah et al., 2025). Based on these considerations, the community service webinar entitled "Good Posture, Bright Future" was conducted as a health education initiative to support the adoption of ergonomic body posture and the prevention of musculoskeletal disorders, particularly among university students and the general public.

METHOD

This community service activity was conducted through an educational webinar entitled “Good Posture, Bright Future,” which aimed to provide education on ergonomic body posture as a promotive and preventive strategy against musculoskeletal disorders. The webinar featured dr. Maulana Hasyimi Hutabarat, Sp.OT, as the main speaker and was moderated by Nabila Aulia T., M.K.M. The material was delivered through a structured presentation addressing the basic concepts of ergonomic posture and its application in daily activities, followed by an expert interactive discussion session.



FIGURE 1. Promotional Flyer for the Webinar Activity

The participants consisted of students from Sultan Ageng Tirtayasa University (UNTIRTA) as well as members of the general public who voluntarily took part in the activity. The implementation of the program was coordinated by a team of lecturers from the Medical Study Program, Sultan Ageng Tirtayasa University, who served as the organizing committee. The activity was conducted with active participant engagement during the discussion sessions, and the evaluation was carried out descriptively based on participant involvement, without the use of quantitative measurement instruments.

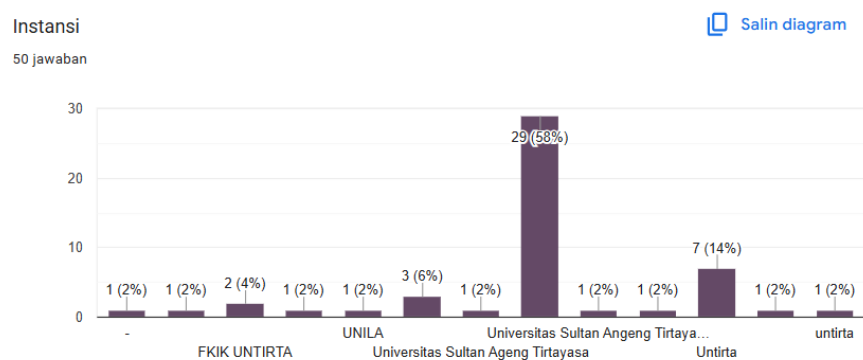


FIGURE 2. Summary of Webinar Participant Attendance.

RESULTS

The community service activity conducted through the webinar “Good Posture, Bright Future” was

attended by 50 participants from various institutional backgrounds. The majority of participants were students from Sultan Ageng Tirtayasa University (UNTIRTA), while the remaining participants came from several other institutions in smaller proportions. This indicates that the webinar primarily reached its main target group of university students while remaining open to participants from diverse institutional backgrounds. The use of webinars as a medium for health education enables broad and flexible information delivery, allowing participants from different locations to engage without spatial and temporal limitations.



FIGURE 3. Documentation of Participant Engagement During the Webinar Discussion

DISCUSSION

Musculoskeletal pain, particularly neck pain and back pain, is a common complaint and contributes significantly to the global burden of disease. Data from the Global Burden of Disease indicate that neck pain is among the leading causes of musculoskeletal-related functional impairment across various age groups (Hoy et al., 2014). One of the primary risk factors for these complaints is the habitual adoption of non-ergonomic body posture, especially during activities involving prolonged use of computers and digital devices (Waersted et al., 2010). This issue has become increasingly relevant with the growing reliance on digital-based activities in daily life.

University students constitute a population at high risk for musculoskeletal disorders due to learning patterns dominated by prolonged static sitting and extended use of digital devices. Previous studies have shown that intensive computer use among students is associated with the development of musculoskeletal symptoms, particularly in the neck and back regions (Dockrell et al., 2015). In addition, suboptimal ergonomic conditions in online learning environments have been reported to contribute to the high prevalence of musculoskeletal disorders among students (Janc et al., 2023). These findings are consistent with studies conducted in Indonesia demonstrating an association between body posture, sitting duration, and complaints of low back pain (Kusumaningrum et al., 2021).

The results of the community service activity through the “Good Posture, Bright Future” webinar indicate that most participants were students, particularly from Sultan Ageng Tirtayasa University, with additional participation from other institutions. This participant composition suggests that the webinar successfully reached its primary target group, which is at higher risk for musculoskeletal disorders, while also providing access to health education for individuals from a broader range of institutional backgrounds. These findings support the role of webinars as a flexible educational medium capable of reaching participants from various locations without limitations of space and time.

Health education represents a key strategy in promotive and preventive efforts aimed at encouraging behavioral change toward healthier lifestyles, including the maintenance of musculoskeletal health. Education on ergonomic body posture can enhance individuals’ understanding of risky postural habits

and promote the adoption of healthier posture in daily activities. Educational interventions accompanied by demonstrations of correct posture have been reported as effective approaches for delivering health messages to the community (Erika et al., 2022). This approach is also aligned with the concept of health literacy, which emphasizes individuals' capacity to understand and utilize health information to make informed decisions that support their health (Nutbeam et al., 2018).

With technological advancements, the use of online platforms such as webinars has become an increasingly relevant alternative for delivering health education. Webinars enable two-way interaction, ease of access, and efficiency in reaching wider target populations. Several community service initiatives have reported the effectiveness of webinar-based approaches as tools for health promotion and the dissemination of health information to the public (Nurfadhilah et al., 2025). Therefore, the implementation of the "Good Posture, Bright Future" webinar is expected to contribute to promotive and preventive efforts against musculoskeletal disorders and to increase awareness among university students and the general public regarding the importance of applying ergonomic body posture as part of a healthy lifestyle.

CONCLUSION

The community service activity conducted through the "Good Posture, Bright Future" webinar was successfully implemented and attended by participants from various institutional backgrounds, with the majority being students from Sultan Ageng Tirtayasa University (UNTIRTA). The use of webinars as a health education medium provides a flexible and easily accessible platform for delivering information on ergonomic body posture. Consequently, this activity supports promotive and preventive efforts against musculoskeletal disorders and contributes to the development of community-based health education initiatives.

REFERENCES

- Alifia, S., & Putri, P. A. (2023). Hubungan posisi duduk dengan keluhan nyeri punggung bawah pada mahasiswa FIKES Universitas Ibn Khaldun Bogor tahun 2023. *Hearty*, 11(2), 215–222.
- Cahyaningrum, G., Naheria, N., Cahyono, D., & Fauzi, M. S. (2025). Upaya pencegahan nyeri punggung dan kelainan tulang belakang melalui edukasi posisi duduk ergonomis. *Jurnal Pengabdian kepada Masyarakat Nusantara*, 6(1), 881–888.
- Chang, D., Lui, A., Matsoyan, A., Safaee, M., Aryan, H., & Ames, C. (2024). Comparative review of the socioeconomic burden of lower back pain in the United States and globally. *Neurospine*, 21(2), 487. <https://doi.org/10.14245/ns.2347038.558>
- Cieza, A., Causey, K., Kamenov, K., Hanson, S. W., Chatterji, S., & Vos, T. (2021). Global estimates of the need for rehabilitation based on the Global Burden of Disease Study 2019: A systematic analysis. *The Lancet*, 396(10267), 2006–2017. [https://doi.org/10.1016/S0140-6736\(20\)32340-0](https://doi.org/10.1016/S0140-6736(20)32340-0)
- Dockrell, S., Bennett, K., & Culleton-Quinn, E. (2015). Computer use and musculoskeletal symptoms among undergraduate university students. *Computers & Education*, 85, 102–109. <https://doi.org/10.1016/j.compedu.2015.02.001>
- Edwar, M., Moch, B. N., & Muslim, E. (2020). Ergonomics and workstyle risk factors analysis of musculoskeletal disorders in students conducting distance learning. In *Proceedings of the International Conference on Engineering and Information Technology for Sustainable Industry*

- (ICONETSI 2020). Association for Computing Machinery. <https://doi.org/10.1145/3429789.3429863>
- Erika, K. A. E., Puspitha, A., Asri, R. M., & Azzahra, N. I. (2022). Demonstrasi postur tubuh yang baik dan benar pada anak sekolah dasar. *Jurnal Pengabdian Masyarakat Hasanuddin*, 104–109.
- GBD 2021 Low Back Pain Collaborators. (2023). Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050: A systematic analysis of the Global Burden of Disease Study 2021. *The Lancet Rheumatology*, 5(6), e316–e329. [https://doi.org/10.1016/S2665-9913\(23\)00098-X](https://doi.org/10.1016/S2665-9913(23)00098-X)
- Hoy, D., March, L., Woolf, A., Blyth, F., Brooks, P., Smith, E., Vos, T., Barendregt, J., Blore, J., Murray, C., Burstein, R., & Buchbinder, R. (2014). The global burden of neck pain: Estimates from the Global Burden of Disease 2010 study. *Annals of the Rheumatic Diseases*, 73(7), 1309–1315. <https://doi.org/10.1136/annrheumdis-2013-204431>
- Janc, M., Jozwiak, Z., Jankowska, A., Makowiec-Dabrowska, T., Kujawa, J., & Polanska, K. (2023). Ergonomics of e-learning workstations and the prevalence of musculoskeletal disorders—Study among university students. *International Journal of Environmental Research and Public Health*, 20(4), 3309. <https://doi.org/10.3390/ijerph20043309>
- Kusumaningrum, D., Samara, D., Widyatama, H. G., Parwanto, M. E., Rahmayanti, D., & Widyasyifa, S. A. (2021). Postur tubuh dan waktu duduk dengan keluhan nyeri punggung bawah (LBP). *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(1), 74–81.
- Mann, K. S., & Verma, I. (2025). An investigation into the prevalence of musculoskeletal disorders among university students: A survey study. *International Journal of Creative Research Thoughts*, 13(5).
- Marcello, S. A. (2024). Pengaruh gadget terhadap postur tubuh anak: Literature review. *JPK: Jurnal Penelitian Kesehatan*, 14(1), 9–13.
- Matheve, T., Hodges, P., & Danneels, L. (2023). The role of back muscle dysfunctions in chronic low back pain: State-of-the-art and clinical implications. *Journal of Clinical Medicine*, 12(17), 5510. <https://doi.org/10.3390/jcm12175510>
- Nutbeam, D., McGill, B., & Premkumar, P. (2018). Improving health literacy in community populations: A review of progress. *Health Promotion International*, 33(5), 901–911. <https://doi.org/10.1093/heapro/dax015>
- Nurfadhilah, N., Nuryati, T., & Anisa, N. (2025). Webinar pemanfaatan media sosial untuk promosi kesehatan. *AS-SYIFA: Jurnal Pengabdian dan Pemberdayaan Kesehatan Masyarakat*, 6(1), 41–49.
- Ramos, R. R., & Godoy, J. M. P. d. (2025). Prevalence and risk factors for musculoskeletal disorders in medical students. *Journal of Functional Morphology and Kinesiology*, 10(4), 392. <https://doi.org/10.3390/jfmk10040392>
- Regmi, K., & Jones, L. (2020). A systematic review of the factors—Enablers and barriers—Affecting e-learning in health sciences education. *BMC Medical Education*, 20(1), 91. <https://doi.org/10.1186/s12909-020-02007-6>
- Waersted, M., Hanvold, T. N., & Veiersted, K. B. (2010). Computer work and musculoskeletal disorders of the neck and upper extremity: A systematic review. *BMC Musculoskeletal Disorders*, 11, 79. <https://doi.org/10.1186/1471-2474-11-79>

World Health Organization. (2022, July 14). Musculoskeletal health. <https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-health>

Zhang, Z., Ferreira, G. E., Downes, J. S., Cockburn, J. V., Burke, W. J., Malliaras, P., Sousa Filho, L. F., Maher, C. G., & Zadro, J. R. (2025). The effectiveness of education for people with shoulder pain: A systematic review. *Musculoskeletal Science and Practice*, 75, 103246. <https://doi.org/10.1016/j.msksp.2024.103246>.