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SITTING IN AN ERGONOMIC CHAIR TO AVOID LOW BACK PAIN IN WORKERS

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ABSTRACT

This paper focuses on the occurrence of low back pain due to prolonged sitting in a chair. This paper is designed descriptively. Data is then collected from various ergonomics experts and research, and the analysis also uses descriptive methods. In conclusion, an ergonomic chair must have a backrest, a chair that can be adjusted up and down, have five wheelchair legs, a chair with stable armrests or elbow rests, a chair with a stable footrest, and a rest after sitting for 30 to 60 minutes. The chair must be able to be used loosely or freely. Using an ergonomic chair will prevent low back pain. It is recommended that factories that employ workers or whose work involves sitting in chairs use ergonomic chairs to avoid low back pain.

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1. INTRODUCTION

Low back pain is not limited to adults but also affects the elderly. It affects both adult and elderly workers, and when it occurs, it can be painful and significantly disruptive to work. This article focuses on the occurrence of low back pain due to prolonged sitting in a chair.

As reported by Yue Le et al. (2024), “in 2021, approximately 628.8 million people worldwide suffered from low back pain”. Furthermore, according to Yulianah Rahmadani et al. (2025), "the prevalence of low back pain in Indonesia is 18%”. Furthermore, according to Yulianah Rahmadani et al. (2025), "based on patient visits from several hospitals, approximately 3%-17% of complaints of low back pain."

Dwi Nur Puspita Sari et al. (2024) concluded in their research that "there is a relationship between sitting position and duration and the incidence of low back pain." Therefore, it is important to sit in an ergonomic chair to avoid low back pain. Low back pain has an impact, as stated in the research of Ghina Dwi Kurnia (2025), which states that "the impact of low back pain on workforce productivity includes increased work absences, decreased work efficiency, and disruptions to service quality. It also increases the risk of work errors due to impaired focus and concentration."

Then, for working sitting in a non-ergonomic chair, according to Heni Safira et al. (2023), "it was found that 36 respondents (38.3%) sat for more than 4 hours every day, and 57 respondents (60.6%) experienced lower back pain. Also, the results of research by Ruth O. Hutasuhut et al. (2021) that "long sitting and complaints of low back pain, with a long sitting time of 5-8 hours".

Therefore, it's necessary to reduce or even eliminate low back pain. To achieve this, ergonomic chairs, including adjustable ones, are needed. This allows for easier seating and allows the user to easily adapt to the work equipment.

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2. METHODOLOGY

This article focuses on low back pain caused by prolonged sitting in non-ergonomic chairs. The writing is designed descriptively. Various data are gathered from expert opinions and research findings, commonly referred to as literature studies. The data are then analyzed descriptively and conclusions are drawn inductively.

3. RESULT AND DISCUSSION

Low Back Pain and Ergonomic Chairs

Low back pain occurs due to two factors: occupational and non-occupational factors. This discussion focuses on low back pain caused by occupational factors, specifically workers who work sitting in chairs.

As Rispidasiona (2023) stated, "an improper and non-ergonomic sitting position while working can cause muscle tension and lower back pain." Similarly, research by Toto Amioto et al. (2017) stated that "ergonomic risk factors contribute approximately 63.5% to the likelihood of developing lower back pain, with the remainder influenced by other factors."

Even Jum Natosba et al. (2016) also stated that "there is a significant difference between back pain before and after being given an ergonomic position, namely a chair with a backrest while weaving songket." So, it's quite clear that sitting in a chair with a backrest is less tiring on the spine than sitting in a chair without one.

The sitting posture of workers is consistent with the chair they occupy, and there is a difference in low back pain. This is consistent with the research of Tia Aura Caroline et al. (2026) that "there is a significant relationship between ergonomic sitting posture and chair design and complaints of low back pain." Similarly, the duration of sitting is related to the incidence of low back pain. This is consistent with the research of Nurul Annisa Amin et al. (2023) which states that "there is a relationship between duration and sitting position and the incidence of low back pain."

Then, how to arrange ergonomic sitting to avoid low back pain. Digital Content Writer (2025) there are 10 ergonomic tips for a healthy office, and sitting posture will make the workspace safer and more comfortable:

1. Work in a neutral position, with your joints aligned naturally to reduce muscle tension.
2. Adjust your chair and desk properly so that your elbows form a 90° angle and your feet rest evenly and comfortably.
3. Place your monitor at eye level, about an arm's length away, to avoid hunching or twisting your neck.
4. Place your keyboard and mouse within easy reach, with your wrists straight and your shoulders relaxed.
5. Support your arms with support, either an armrest or the edge of a desk, to reduce shoulder tension.
6. Avoid excessive force, such as lifting heavy objects with an uncomfortable posture.
7. Ensure adequate space for your knees, feet, and head to move freely.
8. Take regular breaks to move, such as standing, stretching, or walking every 30–60 minutes to reduce fatigue and improve blood circulation.
9. Adjust the lighting and position of your screen to reduce glare and eye strain.
10. Vary your movements, by changing sitting and standing positions, avoid sitting in the same position for too long.

Here are some more tips for sitting posture: Use a good chair with a dynamic backrest and sit comfortably. The top of the monitor case should be 2-3 inches (5-8 cm) above eye level. Avoid glare on the screen; use an optical glass anti-glare filter if needed. Sit at arm's length from the monitor. Feet on the floor or a stable footrest. Use a document stand, preferably parallel to the computer screen. Keep your wrists flat and straight against your forearms when using the keyboard/mouse/input devices. Arms and elbows relaxed and close to your body. Center the monitor and keyboard in front of you. Use a negative-tilt keyboard tray with an upper mouse platform or a downward-tilting platform adjacent to the keyboard. Use a stable work surface and a stable (non-bounce) keyboard tray. Take frequent microbreaks.

4. CONCLUSION AND RECOMMENDATON

Conclusion

Based on the analysis and discussion above, it can be concluded that sitting in an ergonomic chair is a chair that must have a backrest, a chair that can be adjusted up and down, has five wheelchair legs, the chair has a stable armrest, the chair has a stable footrest, then rest from sitting if it has been sitting between 30 minutes - 60 minutes, the chair must be able to be used by the user loosely or freely. By using an ergonomic chair, you will avoid low back pain.

Recommendation

For factories that employ workers or whose work involves sitting on chairs, use ergonomic chairs to avoid low back pain.

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