ABSTRACT

Human resource development is very important for improving productivity and national progress. Workers and students, as future professionals, are encouraged to continue learning and improving their skills. However, many daily activities are performed while sitting for extended periods, such as typing, studying, or working at a computer. Improper sitting positions, such as slouching or leaning too far back, are often overlooked despite the potential health issues they can cause, including back pain, muscle soreness, and even long-term spinal disorders. Additionally, a lack of awareness about the importance of good posture exacerbates the situation. The main issue in this research is the absence of a practical, comfortable, and affordable tool to help monitor body posture movements during daily activities.

As a solution to the often overlooked issue of posture, the Wearable Posture Monitoring System (WPMS) was developed. This device is designed to monitor posture, particularly during sitting activities, and provides alerts in the form of notifications when the user sits in a posture that is increasingly unmaintained. WPMS uses sensors placed on the upper thoracic region to detect body movement toward the front or back. Additionally, the device stores posture data that can be used for evaluation during use. The WPMS is designed as an innovative solution that is cost-effective, comfortable to wear, and easy to use in daily life. The hope is that this device will help maintain proper posture, thereby reducing the risk of spinal issues, particularly among students and workers who spend prolonged periods sitting.

The WPMS has been successfully designed and functions as intended in monitoring the user's posture while sitting and providing notifications when an unideal posture is detected. The WPMS is capable of detecting posture angles with high stability due to its high accuracy and precision of 90.16% and precision ≤1°, supported by user evaluations of the vest and UI/UX, which indicate comfort and ease of operation. The effectiveness of the WPMS lies in its ability to remind users to maintain proper posture during sitting activities, thereby serving as a preventive measure against potential spinal issues in daily activities.

Keywords: Spinal Issues, Monitoring System, Body Posture, Wearable Device