

Monitoring Lumbar Pain using Smart Lumbar Belt

Jeya Daisy¹, Dr. B. Vinoth Kumar², Dr. M. Krishnamoorthi³, Krubhavarshni A⁴

Assistant Professor II, Department of Electronics and Instrumentation^{1,4}

Associate Professor, Department of Electrical and Electronics Engineering²

Professor, Department of Information Technology³

Kumaraguru College of Technology, Coimbatore, India^{1,4}

Dr. Mahalingam College of Engineering, Pollachi, India²

Dr. N. G. P Institute of Technology, Coimbatore, India³

jeyadaisy.i.eie@kct.ac.in¹, bojanvinoth@gmail.com², krishnamoorthi@dnrgpit.ac.in³, krubhavarshni.18ei@kct.ac.in⁴

Abstract: As per World Health Organization (WHO) states that 500,000 to 800,000 humans are struggling with the pain due to seating in the same posture for many hours for their daily work. In this pandemic circumstance, the younger generation is getting impacted and the number of cases rises, also leading to spinal cord difficulties substantially the lower back discomfort. The spinal cord is the longest bone and is surrounded by rings of bone in the human body used to detect the lower back pain we choose the lumbar (L1 to L5) and pelvic (S1 to S4) regions in the vertebrae. In the middle of the bones, intervertebral discs are found and provide more flexibility in movement. The common type of pain is caused because of bad posture, long sitting hours and lack of exercise. The lower back pain occurred due to the muscles being more focused on this project.

Keywords: Lumbar Pain, Bad Posture, EMG Sensor

REFERENCES

- [1]. M.Dhanalakshmi, J.Raja Paul Perinpam, Jose Anand, "Smart Indication System for spinal cord stress detection," International Journal of Recent Technology and Engineering (IJRTE), vol.8, issue 3, pp.6164-6168, Sep 2019.
- [2]. Yuxin Zhang , Pari Delir Haghighi, Frada Burstein, Lim Wei Yap, Wenlong Cheng, Lina Yao and Flavia, "Electronic skin wearable sensors for detecting Lumbar Pelvic movements", p.p.1- 28, Mar 2020.
- [3]. https://www.researchgate.net/publication/319116022_Review_on_risk_factors_related_to_lower_back_disorders_at_workplace Bryn Farnsworth, "Electromyography and How does it works", IMOTION, July 2018
- [4]. N. Nazmi, M. A. A. Rahman, S. A. Mazlan, H. Zamzuri and M. Mizukawa, "Electromyography (EMG) based signal analysis for physiological device application in lower limb rehabilitation," 2nd International Conference on Biomedical Engineering (ICoBE), pp.1-6, Mar 2015.
- [5]. https://www.researchgate.net/publication/351129591_Mapping_Responses_of_Lumbar_Paravertebral_Muscles_to_Single-Pulse_Cortical_TMS_Using_High-Density_Surface_Electromyography
- [6]. <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8502033>
- [7]. https://www.researchgate.net/publication/344985754_WEARABLE_POSTURE_IDENTIFICATION_SYSTEM_FOR_GOOD_SITTING_POSITION
- [8]. <https://pubmed.ncbi.nlm.nih.gov/34011979>
- [9]. Yee Mon Aung, Adel AI-Jumaily, "Estimation of upper limb joint angle using surface EMG signal", Sage journals, vol.10, issue.10, 2013.
- [10]. Richard A, Ekstrom, Roy W Osborn, Patrick L Hauer, "Surface electromyographic analysis of the low back muscles during rehabilitation exercises", Journal of orthopaedic & sports physical therapy, vol.38, no.12, Dec 2008.
- [11]. https://www.researchgate.net/publication/315915463_Wearable_posture_detection_and_alert_system
- [12]. https://www.mdpi.com/journal/sensors/special_issues/emg?view=default&listby=date
- [13]. <https://www.ijert.org/emg-signal-analysis-for-different-sitting-postures-with-and-without-backrest>
- [14]. https://www.researchgate.net/publication/270659087_Using_surface_electromyography_SEMG_to_classify

low_back_pain_based_on_lifting_capacity_evaluation_with_principal_component_analysis_neural_net
work_method

[15]. <https://www.hindawi.com/journals/abb/2021/881748/>

[16]. https://www.researchgate.net/publication/352714397_ARE_YOU_SITTING_CORRECTLY_WHAT_RESEARCH_SAYS_A_REVIEW_PAPER_1