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Posture Clip

Sit properly or I won't let you work

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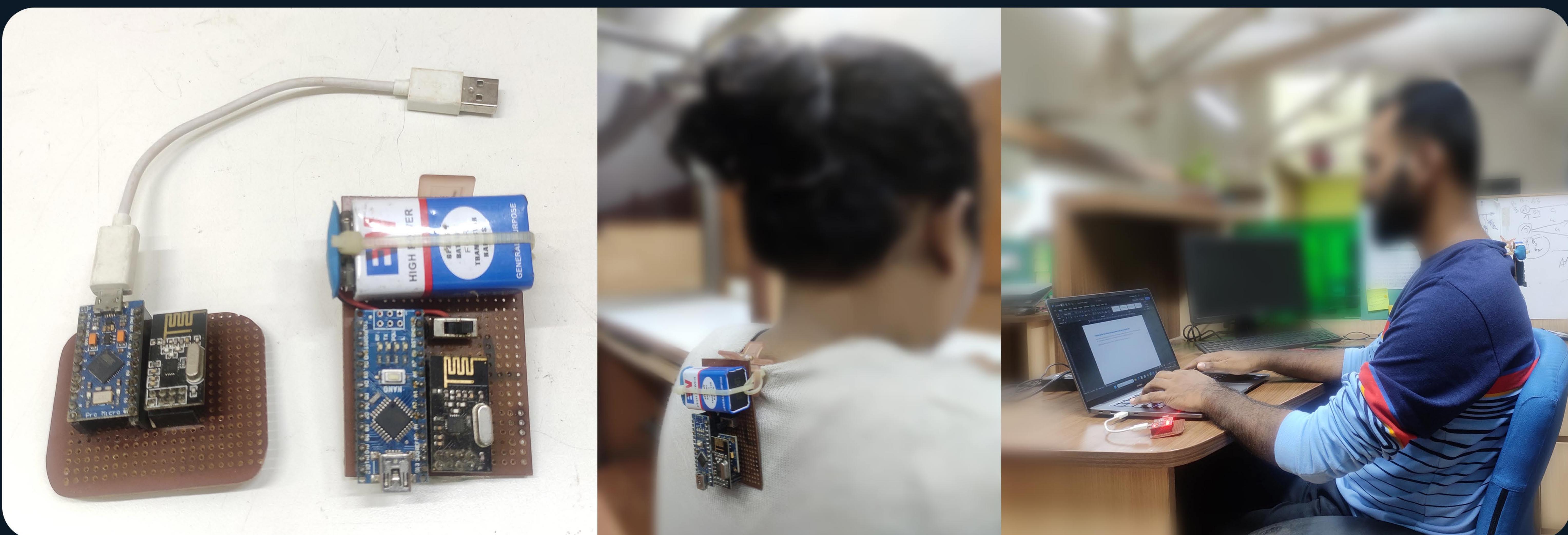


Fig 1: Left: Receiver Module, Right: Sensor module (Posture Clip) Fig 2 and Fig 3: Participants testing the PostureClip device while working in an office setup

INTRODUCTION

In the digital age, the rise of sedentary work has led to a significant increase in poor posture, particularly within India's rapidly growing knowledge-based economy [1]. As more individuals engage in desk-based occupations, the prevalence of musculoskeletal disorders has surged, negatively impacting both health and productivity [2]. Poor posture, characterized by slouching and hunching, poses serious health risks, including chronic pain and reduced work efficiency.

Recognizing this pressing issue, our research introduces Posture Clip, an innovative collar-clipped device designed to provide real-time feedback for posture correction tailored specifically to the needs of the Indian workforce.

The effectiveness of Posture Clip is evaluated through two critical research questions:

RQ1: Is there a significant change in participants' posture after using PostureClip for one month?

RQ2: What are the differential effects of posture changes across various participant categories?

By investigating these questions, we aim to understand not only the immediate impacts of the device on posture but also how different demographic factors may influence its effectiveness.

Our findings contribute insights into promoting worker well-being and ergonomic practices in sedentary work environments, ultimately supporting the health and productivity of the Indian workforce in the face of a changing economic landscape.

METHODS

In this quasi-experimental study, participants wore the Posture Clip device during their workdays for four weeks, recording tilt angle measurements. The participants were randomly assigned to the intervention groups [IG1, n=54 (with visual feedback); IG2, n=55 (without feedback)], which used the collar-clipped device, and the control group (CG, n=56), which did not use the device.

Semi-structured interviews were conducted with participants to gather qualitative insights on their experiences and perceptions of the device.

FINDINGS

The analysis of the Posture Clip device's effectiveness revealed significant improvements in posture alignment among participants. Quantitative data indicated a statistically significant reduction in neck flexion ($t = -4.22, p < 0.001$) and shoulder elevation ($t = -2.93, p = 0.005$) in Intervention Group 2, as well as improved lumbar curvature ($t = 3.11, p = 0.003$) following device use. Chi-square tests demonstrated a significant decrease in the frequency of common posture deviations, including forward head posture ($\chi^2 = 10.24, p = 0.001$) and rounded shoulders ($\chi^2 = 6.78, p = 0.009$). Correlation analysis highlighted a strong positive relationship ($r^2 = 0.78$) between the duration of device usage and changes in posture angles, particularly in participants who wore the device consistently. Participants expressed overall satisfaction with the device, indicating increased posture awareness and reduced discomfort. However, barriers to adherence, such as discomfort from the clip and self-consciousness were reported.

CONCLUSION

This study evaluates the effectiveness of the Posture Clip device in promoting proper posture alignment among office workers. Participants receiving feedback to correct their posture showed significant improvements in neck flexion, shoulder elevation, and lumbar curvature, aligning with findings from previous research on wearable devices. The placebo group showed no significant changes, indicating the device's effectiveness. The results demonstrate the potential of posture correction interventions to enhance employee health and productivity, reduce musculoskeletal disorders, and highlight the importance of consistent device use.

REFERENCES

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2. Ismail Maakip, et.al. 2016. Prevalence and predictors for musculoskeletal discomfort in Malaysian office workers: Investigating explanatory factors for a developing country. Applied Ergonomics 53 (2016), 252–257.

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