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**STUDY ON ERGONOMIC RISK FACTORS FOR
MUSCULOSKELETAL DISORDERS IN THE
ACADEMIC ENVIRONMENTS OF ENGINEERING
TECHNOLOGY STUDENTS**

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University of Moratuwa

Sri Lanka

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Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree
Degree of Master of Engineering

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DECLARATION

I declare that this is my work, and the dissertation does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgment is made in the text. I reserve the right to use this content in whole or part in future works (such as articles or books).

Signature:

Date: 12/06/2025

The above candidate carried out research for the master's dissertation under my supervision. I confirm that the student's declaration above is true and correct.

Name of Supervisor: Prof. H.K.G. Punchihewa

Signature of the Supervisor:

Date: 13/06/2025

DEDICATION

This dissertation is dedicated to my parents, especially my mum Zumbra, who have always loved me unconditionally and looked after my kids and whose good examples have taught me to work hard for the things that I aspire to achieve. This work is also dedicated to my beloved husband who has been a constant source of support, care, and encouragement throughout this research work. I am truly thankful for having you to achieve whatever I can.

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ABSTRACT

The students can pursue careers as technologists with relevant engineering competencies in technological institutes. Since students studying technology spend most of their time in academic settings and have a constant posture, most individuals may exhibit musculoskeletal disorder symptoms (MSD). Therefore, the study aims to identify the prevalence rate and possible risk factors associated with developing MSD among technology students in Sri Lanka. The objectives were to ascertain the prevalence rate, identify potential risk factors for the development of MSDs, and propose interventions to mitigate the risks to lessen the MSDs among Sri Lankan technology students.

The quantitative descriptive and cross-sectional study was carried out among 244 technology students at the Advanced Technological Institutes in Sri Lanka's Southern and Western provinces to determine the possible ergonomic risk factors associated with MSD and analyze the outcomes behavior of students for one year, which may cause MSD-related issues.

A standard Nordic Musculoskeletal Questionnaire (NMQ) including 15 body parts was used to assess the prevalence of musculoskeletal disorders. Ultimately, the statistical analysis procedure was performed using the software SPSS-22 for this study. The Quick Exposure Checklist (QEC) was used to examine the four main body parts (neck, wrist/hand, shoulder/arm, and back); meanwhile, the psychosocial factors checklist was also validated through the Perceived Stress Score (PSS).

The study revealed an 86% prevalence of MSDs and the highest prevalence in the lower back (65.6%, n = 160). Then, in the next range, the neck is 59.4%, the knees 50.8%, the wrists 34%, the shoulders, and the lowest fingers (14.6%). The demographic factors affecting MSDs are BMI, family status, and daily travel. Physical and environmental risk factors include desk and bench configurations, aging tools and equipment, and awkward posture due to repetitive actions. In addition, time pressure, exposure to bullying, and raging aggression were identified as psychological elements.

It is possible to reduce the prevalence of students' MSD by raising awareness programs, ergonomic seating arrangements, eliminating hazards by implementing preventative measures for productivity, and promoting a safe environment.

Keywords: Ergonomics Risk factors, Musculoskeletal Disorders, academic, Intervention

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