

ORIGINAL ARTICLE

Preliminary Study of Postural Safety and Ergonomics Analysis Related to Cycling Activity

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ABSTRACT

Introduction: In cycling activity, having a good proper posture can reflect good performance and comfort of the cyclist. Incorrect posture will lead to future health problems such as back pain. On some occasions, the muscle activity of the cyclist also can be affected due to improper posture, non-ergonomic posture. Design and load can be major factors of injury as well. This preliminary study helped to identify and investigate the postural safety and ergonomic analysis of cyclist muscle activity during cycling. **Methods:** A questionnaire was used to get an overview and prior knowledge of postural safety and ergonomic of random cyclists on the university campus. Then, Surface Electromyography sEMG and postural angle from Kinovea software were used to measure and compare the results with and without load among cyclists. In this study, there was a significant effect of saddle height and pedalling on the cyclist's body posture. This showed an optimum power and effectiveness performance while cycling. This led to comfort and reduce the chance of injury such as back pain towards cyclist. **Results:** Based on the results, the lower back muscles activity pattern for cyclists with the load was higher compared to cyclists without the load (the optimum saddle height was applied). The cyclist's lower back muscles activity showed an increasing pattern overtime. **Conclusion:** Therefore, this study will be helpful to the cyclist to get awareness regarding correct posture safety and feel more comfortable when cycling. Further improvement should be taken for future enhancement of the findings. *Malaysian Journal of Medicine and Health Sciences* (2022) 18(9):27-33. doi:10.47836/mjmhs18.s9.4

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INTRODUCTION

Nowadays, cycling is one of the popular sports or recreational activities that can offer many potential health benefits to the cyclist. Cycling can be considered as one of the most beneficial physical activities to the whole body of the cyclist. Due to the cycling advantages, cycling has been recognized as an alternative sport or activity that encourages great public health to humans (1, 2). Thus, cycling is one of the important topics to study in many perspectives mostly related to performance, human safety and health. As cycling can give many good benefits, it also gives several drawbacks to cyclists' physical health such as muscle soreness and back pain. Therefore, study on biomechanics towards cyclists has been widely carried out by the researchers (3).

Based on the ergonomics and postural safety perspectives, one of the major concerns during cycling is ergonomic design and human body posture during cycling. There are some studies being carried out between the minimal amount of energy and specific speed used by the cyclist (4). Other than that, there are some researchers who focused on three main positions of cyclists such as upright, dropped and elbows positions to find the best position during cycling (5,6). The human body position is crucial to determine the best posture and pattern to get the most effective position. Other than that, previous research shows that the numerical simulations method is the most accurate in assessing aerodynamics (7).

During cycling, most of the lower limb body parts have been utilized to move the bicycle. Some studies also showed the position of pedal and foot give a significant effect on cyclist performance. Other study also mentioned that pedalling technique could improve the cyclists' force effectiveness and power output (8). Another study was also done by other researchers