

ABSTRACT

India, the global leader in the two-wheeler market, has had a remarkable expansion in its two-wheeler sector, with output increasing from 5.47 million units in 2000-01 to 42.22 million units in 2023-24. Motorcycles, accounting for more than 60% of overall sales, are not just means of transportation but essential assets for Indian households, enabling mobility and earning revenue through services such as delivery. Although the sector is experiencing significant growth, there has been a troubling increase in motorcycle-related accidents, resulting in motorcyclists facing a fatality risk that is 30 times greater than that of passengers in cars. The literature cites protective clothing as effective in decreasing soft tissue injuries and facilitating quicker recovery by limiting the risk of infections. Regrettably, there is a significant lack of research and design addressing the specific needs and requirements of Indian motorcycle riders.

This thesis presents a methodical approach to developing motorcycle riding clothing (MRC) specifically designed for Indian riders. It presents an integrated design model for MRC that integrates protection, comfort, and aesthetics—developing MRC by employing an ergonomic design approach by analysing the posture of the motorcycle riders, taking into account thermal, moisture, and tactile comfort, and using advanced digital technologies such as 3D body scanners, and CAD software to generate garment patterns which were carried out and reported in individual chapters. Material selection was focused on the selection of materials, as per the body mapping technique, that are well-suited for India's climate. Finally, a physical sample of motorcycle rider jackets was realized, and the sample was assessed and evaluated by user testing.

In summary, a model of multi-functional design has been developed scientifically and systematically, with which an ergonomic motorcycle clothing with superior functional performance was achieved. The outcome of this research helps establish a systematic procedure for producing functional clothing for motorcycle riders in India.