

2021 - Motorcycle helmet selection and usage for improved safety: A systematic review on the protective effects of helmet type and fastening

ABSTRACT

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Objective

Motorcycle helmets are the most common and effective protective device to reduce head injuries and mortality in crashes among powered two-wheeler riders. Even if they are globally recognized as effective, there are still concerns regarding their correct use, which is necessary to achieve maximum head protection. The goal of this systematic review is to assess which characteristics of helmet design and use showed a positive influence on rider safety, in order to provide insights to improve end-user helmet usage.

Methods

A literature search was carried out combining two sets of keywords, one related with either motorcycle or rider and the other referring to either protective equipment or injuries. After the exclusion of duplicates, 977 papers were screened by reviewers, thus identifying 32 papers that were analyzed in group discussions.

Results

Among the papers included in this study, no strong conflicting conclusions emerged in their results. The studies focusing on the use of different types of helmets highlighted that full-face helmets, compared with other standard helmets, have a positive influence on head injuries and facial injuries. Correct fastening was clearly beneficial for head and facial injuries, induced injuries, and helmet ejection.

Conclusions

This systematic review provides important insights to improve the usage of helmets by end-users. Correct fastening is a crucial factor to avoid helmet roll-off during a crash. Most studies agreed that full-face helmets provide higher protection in comparison with other standard helmets, especially for facial injuries, and no negative influence with respect to neck and spinal injuries.