

Assessment of Child Helmet Efficacy for Motorcycle Use in Malaysia

Abstract

With the ever increasing popularity of motorcycle as a mode of transport in not only Malaysia and but also a few other countries in Southeast Asia, the demand for an efficient system of protection is highly anticipated. This, however, has heightened our concern on the limited mechanical protection afforded to the motorcyclists and its passengers by passive protection systems such as the safety helmet as a preventive measure to reduce or eliminate injuries and/or fatalities.

Numerous scientific literatures have proven the importance and effectiveness of legislation, enforcement and helmet standards in improving the safety and health of motorcyclists on the road. However, it is noted that very limited materials are available concerning injuries among children in relation to motorcycle accidents. Furthermore, issues such as age limit and physical requirements for usage of a motorcycle need to be studied as a precursor to any review exercise of motorcycle legislation and standards.

The World Health Organization stated that children injury in road traffic accidents is a growing problem in the world. More specifically, accident data extracted for year 2006 to 2007 in Malaysia reflected a consistent pattern of motorcycle casualties in children of 1 to 18 years of age. The fatality rate of those between 16 to 18 years was more than double when compared to the lower age group. However, for the age group of 1 to 6 years and 7 to 12 years, fatality percentages were 3.5% (53) and 4.4% (67) respectively, in which more than 88% rode as passengers. This may be influenced by travel exposure and licensing age. This unfortunate trend raises the urgent demand for an in-depth study so that appropriate measures could be effectively taken.

Comparative studies on helmet standards indicated the influence of size and mass of safety helmets in relation to injury risk. In particular, further research is needed concerning head and neck injuries among children. Detailed injury tolerances of children would have to be studied in order for us to determine the proper protection system requirements. From injury perspectives, the two common types of injury associated with helmet wearing are brain injury and neck injury (cervical trauma). A number of experimental models have been developed to determine the injury limit on each of the types. In short, it is noted that the bio-mechanical limits and anthropometry between adult and children are different and the injury limits of children need to be categorized by age group. This is because children are developing and growing at this stage and their bio-mechanical limits and anthropometrics change accordingly.

An observational study at primary schools in Klang Valley, Malaysia, indicated the prevalence of non-use of safety helmet (> 60%) in urban and suburban locations. Notably, significant correlations of helmet use and school locations were identified. However, to identify factors

influencing the low usage rate would require further extensive investigation for the development of an effective countermeasure.

Additionally, tests on helmet performance demonstrated the equivalent performance of child and adult helmets, which implies that conformance to the established standard of MS1:1996 may not pose as a difficult task. The real challenge is to come up with a proper standard to address head protection needs for children.

Another issue of concern is the availability and accessibility of various designs of children helmets in the market, which could be categorized into standard-compliant helmets, sub or non-standard and game/toy helmets. The standard helmets may have some limitations in sizes to provide a 'good-fit' for children less than six years old, which may lead would be users to look for other options. Additionally, the non-compliant groups have distinct differences in configurations, constructions and materials, which contribute to their inferior capability in absorbing impact forces in an accident, thus making them unsuitable for road use. These shortcomings lead to the restrictions on the present head protection system and it also warrant an in-depth study for the development for a better system.

To conclude, there is an undeniable need to protect children travelling on motorcycles on the road. The establishment and introduction of appropriate protection systems, helmet standards and motorcycle regulations will help to realize our vision of safer travel for all and for children in particular.

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