Vulnerable Child Pedestrians in Rapidly Motorizing Developing Countries

Authors: Ediriweera Desapriya, PhD, Kate Turcotte, MSc, Eshani Fernando, BSc, and Ian Pike, PhD, Vancouver and Burnaby, British Columbia, Canada
Section Editors: Tomi St. Mars, RN, MSN, CEN, FAEN, and Anna M. Valdez, RN, PhD, CEN, CFRN

CE Earn Up to 10 CE Hours. See page 501.

The global economic burden of motor vehicle crashes and pedestrian injuries is approximately $500 billion. Children are most vulnerable to being struck by a motor vehicle because they are often impulsive and lack the integrated sensory and cognitive skills required to judge the risks of oncoming traffic.[1] It is predicted that pedestrian road deaths will increase by 65% in the next 10 years.[2]

Recent United Nations resolutions encourage Member States to continue using the *World Report on Road Traffic Injury Prevention* as a framework for road safety efforts. The United Nations supports implementing the World Health Organization report recommendations, paying particular attention to the needs of vulnerable road users such as pedestrians.[2,3]

Child pedestrian safety is especially critical in rapidly motorizing countries. Such countries generally lack the resources to physically separate vulnerable road users from motorized traffic.[4] Pedestrians, cyclists, rickshaw operators, and moped users still represent the majority of road users in such countries. Yet, there are often no sidewalks or bicycle paths, and where such amenities do exist, they tend to be heavily obstructed by trees, trash, drainage ditches, and vendors.[4] Children in developing countries are 6 times more likely to die in a motor vehicle crash than their counterparts in developed nations.[5]

The streets and yards around children's homes in most developing countries are socially enriching and cognitively stimulating spaces in which children can play, although the rapid increase in traffic is a safety threat.[6,7] A study in Iran shows that over half (54.2%) of children with transport-related injuries were pedestrians.[7]

It is important to recognize that, apart from other pedestrian-related risk factors, vulnerable children in underdeveloped countries are victims of poor design features of vehicles. These vehicles are made in and for industrialized countries and do not take the unique traffic situations in developing countries into consideration. To date, vehicle bumper systems are basically designed to prevent or limit physical damage to expensive components of the vehicle, thereby reducing insurance costs of replacing parts of the vehicles in crashes by protecting the hood, trunk, grill, fuel, exhaust, and cooling system in low-velocity crashes.[3] There appears to be an association between light trucks, sport utility vehicles, and vans and child pedestrian fatalities.[3] The collision tends to result in death as opposed to injury because of severe head injuries. The elements that increase the risk of death include the size, weight, and front stiffness of these types of vehicles, as well as the driver's visibility, as compared with cars. Light trucks, sport utility vehicles, and vans have also been implicated in back-over fatal collisions with children.[3]

Traffic-calming policies are associated with reductions in child pedestrian fatalities.[8] Examples of traffic-calming strategies include speed humps, street closures, median barriers, and traffic circles, among others.[9] Speed humps have been associated with a decreased risk of child pedestrian injuries. However, a recent World Health Organization report highlighted the fact that less than one-third of countries meet basic criteria for reducing speed in urban areas.[10]

Ediriweera Desapriya is a Research Associate, Department of Pediatrics, Faculty of Medicine, University of British Columbia, and BC Children's Hospital, Vancouver, British Columbia, Canada.

Kate Turcotte is a Researcher, Department of Pediatrics, Faculty of Medicine, University of British Columbia, and BC Children's Hospital, Vancouver, British Columbia, Canada.

Eshani Fernando is an undergraduate candidate, Faculty of Health Science, Simon Fraser University, Burnaby, British Columbia, Canada.

Ian Pike is an Assistant Professor, Department of Pediatrics, Faculty of Medicine, University of British Columbia, and BC Children's Hospital, Vancouver, British Columbia, Canada.

For correspondence, write: Ediriweera Desapriya, PhD, BC Children's Hospital, L408-4480 Oak St, Vancouver, British Columbia, V6H 3V4, Canada; E-mail: edesap@cw.bc.ca.

J Emerg Nurs 2012;38:482-3.

Available online 24 July 2012.

0099-1767/$36.00

doi: 10.1016/j.jen.2012.05.026

The WalkSafe program has been successful in significantly lowering the number of childhood pedestrian injuries in developed countries.[8] The WalkSafe program can be duplicated in under-resourced countries effectively. Multiagency involvement and school leadership for a multiagency coalition for child pedestrian safety are keys to the success of this program. Successful WalkSafe programs help to create safer environments for children to walk to and from school.

Child pedestrian safety cannot be achieved unless speed limits are drastically reduced and strictly enforced. In the United Kingdom and in some European countries, there are Home Zones schemes where groups of streets are designed and laid out so that car users do not have priority over other users, with cars traveling at little more than walking pace. The design enables child pedestrians to use the streets as a social space, meaning that children can play outside, adults can socialize, and the local communities can take control of their own environments.[8,9]

Sometimes, a lack of resources in developing counties deters investing wisely in construction projects that incorporate environmental safety changes; however, in Europe there is evidence that legislation has also proven effective in reducing child pedestrian crashes.[11] Countries with the lowest child pedestrian fatality rates have been found to have legislation in place making drivers automatically responsible for any crash involving a child pedestrian or cyclist under civil law.[11] Emergency nurses can advocate for this type of legislation in both developed and developing countries, accompanied by higher and more severe penalties for speeding in built-up areas where children are likely to be out and about on foot and bicycles.

Virtually every major advance in public health has involved the reduction or elimination of risk.[12] There is a clear need to create safe environments, eliminating vehicle danger, so that our children can walk, cycle, and carry out other activities without compromising their safety. The public health community, which includes nurses, should advocate that the vehicle manufacturing industry produce motor vehicles with 5-star safety ratings, not only for vehicle occupants but also vulnerable road users including child pedestrians and cyclists.

REFERENCES

1. Chakravarthy B, Vaca FE, Lotfipour S, Bradley D. Pediatric pedestrian injuries: emergency care considerations. *Pediatr Emerg Care.* 2007;23 (10):738-44.
2. Peden M, Scurfield R, Sleet D. *World Report on Road Traffic Injury Prevention*. Geneva, Switzerland: World Health Organization; 2004.
3. Desapriya E, Sasages D, Subzwari S, Basic A, Turcotte K, Pike I. Do light truck vehicles (LTV) impose greater risk of pedestrian injury than passenger cars: a meta- analysis and systematic review? *Traffic Inj Prev.* 2010;11(1):48-56.
4. Desapriya E, Pike I, Turcotte K. Sports utility vehicles and vulnerable road users. *Am J Public Health.* 2007;97(Suppl. 1):S4-5.
5. Nantulya VM, Reich MR. The neglected epidemic: road traffic injuries in developing countries. *BMJ.* 2002;234(7346):1139-41.
6. Moore RC. Streets as playgrounds. In: Moudon AV, editor. *Public Streets for Public Use*. New York, NY: Van Nostrand Reinhold; 1987:45-62.
7. Timperio A, Crawford D, Telford A, Salmon J. Perceptions about the local neighborhood and walking and cycling among children. *Prev Med.* 2004;38(1):39-47.
8. Zhu X, Arch B, Lee C. Walkability and safety around elementary schools—economic and ethnic disparities. *Am J Prev Med.* 2008;34 (4):282-90.
9. Lyons RA, Towner E, Christie N, et al. The advocacy in action study a cluster randomized controlled trial to reduce pedestrian injuries in deprived communities. *Inj Prev.* 2008;14(2):e1.
10. World Health Organization. Global status of traffic safety. Available at: http://whqlibdoc.who.int/publications/2009/9789241563840_eng.pdf. Published 2009. Accessed January 17, 2012.
11. Christie N, Towner E, Cairns S, Ward H. *Children's Road Traffic Safety: An International Survey of Policy and Practice?* Road Safety Research Report No. 47. London: Department of Transport; 2004.
12. World Health Organization. *Reducing Risks, Promoting Healthy Life*. Geneva, Switzerland: World Health Organization; 2005.

Submissions to this column are encouraged and may be sent to
Tomi St. Mars, RN, MSN, CEN, FAEN
tst33@aol.com or
Anna Maria Valdez, RN, PhD, CEN, CFRN
annav409@gmail.com