Engaging Parents to "Walk with their Kids" in a School-Based Early Childhood Pedestrian Safety Intervention.

Authors: Donna Cross, Marnie House, Margaret Hall, Jill Darby (presenter)

Abstract

In Australia, road trauma is the leading cause of death among 0-14-year-old children. Empirical and theoretical evidence suggests young children can begin to be trained from 4 years of age to use roads more safely, with parents identified as the best trainers.

This paper describes the Walk with Your Kids: Early Child Pedestrian Injury Prevention Project (ECPIPP). It outlines the Project aims, methodology, evaluation instruments and the parents/carers and school intervention development and theoretical foundation.

The ECPIPP is a three-year randomised group intervention trial that aims to build the capacity of a cohort of parents/carers and teachers of 4-year-old children to support and protect these children as pedestrians in the road environment.

This innovative parent-directed intervention provides home- and classroom-based resources, whole-of-school activities and strategies to help school staff to actively engage parents in strategies to improve their own and their child's road safety. Each family received a video an accompanying parent booklet, innovative home activities and numerous behavioural cues, such as postcards and fridge magnets, to enhance their understanding of the developmental, cognitive and perceptual limitations of children and to translate these understandings into safer pedestrian practice with their kindergarten age child/ren.

This rigorous intervention research trial has the potential to improve the understanding of the relative contribution of parent/school-based interventions in improving road safety for young children and to describe the most effective intervention strategies to support parents to develop their own children's pedestrian safety.

Introduction

In Australia, road trauma is the leading cause of death among 1-14 year olds with death rates in 2001-2003 resulting from road trauma 2.7/100,000 children (Al Yaman, Bryant et al. 2002; AIHW 2005). While fatalities from pedestrian injuries among children 0-14 years have declined from 3.7 per 100,000 children in 1991 to 2.7 in 2000, the reductions are mostly among 10-14 year olds rather than the younger age range (UNICEF 2001). In 2000 hospitalisation rates for pedestrian injuries for 5-9 years olds were 29.8/100,000 children

being the third highest cause of serious injury after falls and pedal cyclist injuries (AIHW 2005). Children from low-socio-economic backgrounds, Indigenous children also have a higher risk of injury and death from road trauma injuries than other Australian children (UNICEF 2001; Owens 2002). Recent evidence suggest that childhood mortality and morbidity rates as a result of injury are preventable and can be effectively reduced through implementation of preventative programs (AIHW 2005).

There is growing evidence that young children's lack of cognitive and perceptual abilities to deal with traffic situations, such as poor search behaviour, not choosing the safest places or seeking help to cross the roads, their small physical size and their emotional immaturity (i.e.: easily distracted) place them at increased risk in the road environment (Schieber and Thompson 1996; Elliott 2000). Elliott (2000) suggests that young children take steps about half the size of adults' resulting in a 'doubling' of the perceived road width. Hence, to cross the road safely children need more time to cross and larger gaps in traffic. These findings and the evidence that one half of young pedestrians injured were unaccompanied (Elliott 2000), demonstrate clearly that children under age 10 need to be accompanied by an adult when crossing roads (Avery 1974).

Stevenson and Jamrozik et al (1995) in reporting the Western Australian case-control study involving child pedestrians aged one to 14 years, identified four key environmental and behavioural factors that independently predicted the likelihood of child pedestrian injury. These included the volume of traffic encountered by the child during his or her exposure to the road environment, the presence of visual obstacles, availability of footpaths on the child's street of residence, and importantly, the child's behaviour (Stevenson, Jamrozik et al. 1995).

In assessing children's limitations in the road environment, numerous studies have shown that young children can begin to be trained from 4 years of age to use roads more safely (Lee, Young et al. 1984; Young and Lee 1987; Tucker 1993; Thomson, Tolmie et al. 1996; Thomson and Whelan 1998). Elliott (2000) suggests effective training needs to be in a social context, in real world situations, through discovery and problem solving rather than rules, at their own pace and with positive feedback from a caring adult. Young children's 'concrete' stage of learning skills inhibits their ability to transfer this learning from abstract practice (in the classroom) to real world roads (Thomson, Tolmie et al. 1996) and the adult to child ratio available in most schools limits the capacity of schools to adequately train young children (safely) on real roads (Elliott 2000). Recognising parents role in enhancing

children's safety on and near roads is important (Elliott 2000) as parents provide the best role models and one of the only means children receive personalised one-on-one training to practise crossing real roads (Cross 2005).

Project aims

The 'Walk with Your Kids': Early Childhood Pedestrian Injury Prevention Project (ECPIPP) aims to develop behavioural and environmental factors that may help to build the capacity of parents and teachers to begin to teach young children how to use roads more safely, especially as a pedestrian. This project provides resources, guided skills training and support strategies to actively engage parents of young children to improve their children's and their own road safety. The intervention addresses some of the barriers that have discouraged schools and parents to be involved in road safety education. These can include the lack of appropriate resources, time and perceptions that parents may not want to be involved or are not interested in pedestrian safety education.

This study primarily aims to enhance parents':

- Knowledge of the cognitive and developmental limitations of children under 10, especially in relation to pedestrian safety;
- Attitudes regarding the importance of parent involvement in pedestrian training for children under 10 years of age;
- Modelling of safer pedestrian behaviours;
- Advocacy for safer road environments for their children; and
- Self-efficacy to teach their children how to use roads more safely.

Methodology

The ECPIPP is a three-year randomised group intervention trial (2004-2006) designed to measure the impact of a parent-enhanced school pedestrian safety intervention with a cohort of kindergarten children and their parents (intervention group), compared with schools receiving the regular WA Department of Education primarily classroom-based road safety materials (comparison group). The parent and classroom intervention is being disseminated and implemented during the first two years (2004-2005) of the three-year study. The third year of the study (2006) will be used to collect follow-up data and to analyse data and disseminate the study results.

Table 1: Study design

Condition	2004 (kindergarten)	2005 (Pre-primary)	2006 (follow-up) (Year 1)
Early childhood pedestrian intervention group (n=500 students and parents)	O_1 X_1 O_2	X_2 O_3	O_4
Regular school program – comparison group (n=500 students and parents)	O_1 X_3 O_2	X_4 O_3	O_4

Symbols: O – Observation X - Intervention

The intervention aims to develop parents' capacity to enhance their child's road safety skills, knowledge and behaviours, with reinforcement and support from kindergarten and pre-primary teachers. Communication cues targeting the home environment are being used to remind and encourage parents to begin to systematically train and support their children as a pedestrian in the road environment.

Selection and Recruitment

Due to higher rates of pedestrian injury among children in lower socio-economic areas, this study aimed to test this intervention in schools with higher levels of disadvantage as determined by Socio-Economic Indexes for Areas (SEIFA Index) (Australian Bureau of Statistics 2003). All metropolitan Government primary schools with onsite kindergartens with enrolments exceeding 34 kindergarten students were stratified according to total population size of the kindergarten and socio-economic status. Using the 2001 SEIFA Index, each school's postcode was used as a proxy measure of socio-economic status to select twenty-seven lower SES schools and randomly assigned to either the intervention (n=13) or the control group (n=14).

In September 2004, we sent baseline questionnaires via the classroom teachers to two of the kindergarten cohort's parents/carers and their classroom teacher. Of the 1238 parent/carer long and short questionnaires sent to the homes of the children 870 (70.3%) long questionnaires and 570 (46%) of the short questionnaires were completed. To maximise response rates we actively engaged classroom teachers in the parent questionnaire follow-up; mailing follow-up letters to non-responding parents; preparing user-friendly short questionnaires; seeking the Dept. of Education and the Principal's endorsement of the process; and offering minor incentives for questionnaire completion. We also provided all schools with data summary reports at each data collection. These reports meant schools had more of a vested interest in securing higher response rates and ideally motivated them to encourage parent involvement (Cheadle, Psaty et al. 1995).

Data collection and instruments

A range of evaluation instruments are being used in the study including parent questionnaires for two parents/caregivers per family; an annual pre-post classroom teacher questionnaire; a teacher log of classroom and home learning activity implementation, and a principal interview. Parents of all kindergarten students (n=1238) were surveyed using a self-completed questionnaire at baseline in 2004 and are being followed for three years until 2006. This 28-item questionnaire and a shorter questionnaire were sent home via the kindergarten teacher addressed to the parents/carers of each child. The shorter, four-page questionnaire was addressed to another adult in the house who cares for or walks with the kindergarten child. Parents were provided with the option of completing the questionnaire via a telephone interview.

Most of the parent questionnaire items were based on those used in the Child Pedestrian Injury Prevention Project parent questionnaire (Cross, Stevenson et al. 2000), and the remainder were adapted from other pedestrian safety–related questionnaires developed to measure parents' understandings, attitudes and behaviour (Lam 2001).

Teacher questionnaires were developed to assess knowledge, attitudes and skills in relation to road safety, along with measures of program implementation, and training satisfaction and implementation.

All questionnaires were pilot tested for reliability with a convenience sample of parents who were not part of the study cohort.

***Walk with Your Kids* Intervention**

The *Walk with your Kids* intervention comprised three components involving parents/carers, classroom teachers and the whole school community. The parent/carer intervention aimed to increase their understanding of the developmental and behavioural characteristics of children younger than 10 years that increase their risk as pedestrians. The comprehensive intervention systematically targeted factors identified as protective, including strategies to enhance parent-child communication; parent modelling; parent road safety attitudes and beliefs; normative family standards about road safety; family management techniques and parenting style as well as road safety–related knowledge, skills and behaviours (Elmquist, 1995; Cohen, 1997; McCallum, 1991). Unlike typical school/home based interventions where parents reinforce children's learning from school, this intervention targets

parents as the primary 'teachers' while the classroom teacher reinforces and encourages this home-based learning.

The classroom intervention is designed to reinforce and support training provided by parents to the cohort of kindergarten children. It is structured around five learning outcomes that address each of the five road crossing steps designed to increase children's safety, emphasised to parents in this study. The whole-school intervention provides information and strategies to review or develop school road safety policies, as well as strategies for engaging whole-school involvement in road safety activities.

The home and teacher intervention components included:

- The '*Take a walk in my shoes' video,* which is a 13 minute video designed to enhance parents' understanding of the developmental, cognitive and perceptual limitations children have in the road environment and to translate this knowledge into safer pedestrian practice and role modelling with their child. Each parent in the intervention condition received a copy of this video and a booklet titled **'***Five things you can do to keep your child safe near roads'*. The booklet reinforces information presented in the video and provides parents with strategies to practise crossing roads safely with children. This booklet supports the video and was distributed to each parent in the intervention condition.
- *Home Activity Sheets* that complement the classroom learning area activities and were sent home for parents to work through with their child/ren. These activity sheets encourage parent-child interaction and communication about pedestrian safety and promote the importance of practising road crossing as often as possible in the real road environment.
- **'***Walk with Your Kids'* postcards and fridge magnet 'cues' which were designed to remind parents of pedestrian safety actions and skills they can practise with their children. Children were asked to display the A5 size magnet on the fridge at home and 'display' the postcards on the fridge as they are received in the mail.
- The *Walk with your Kids Classroom Activities* for Kindergarten program in 2004 and Pre-primary in 2005 were designed to systematically introduce children to five steps identified to help them cross roads safely. The learning activities are developmentally appropriate, with a focus on learning through play. The activities reinforce and support children's learning at home with their parents
- The *whole-school manual* that assisted intervention schools to develop or review their schools' road safety policy and provided planning strategies, school and community

awareness raising activities and approaches to review and enhance the safety of the road environment around schools. Each intervention school received an *individually tailored binder* containing information relevant to the implementation of the *Walk with Your Kids* project for that school including sample whole-school activities. An A3 *Action Plan poster* was also developed to present an overview of strategies to create a whole-school road safety vision for each school.

- In 2004 and 2005 all principals and teachers of the cohort of children from intervention schools were invited to attend a six-hour teacher *training session*.

Theoretical Support for the ECPIPP Intervention Design

The ECPIPP intervention was based on four groups of contemporary theory that focus on parents' and children's behaviour; children's perceptual and motor development; the relationships between individuals and their environments; and organisational change and implementation. Similar to the CPIPP project (Howat, Jones et al. 1997), a modified version of the PRECEDE/PROCEED (Green and Kreuter 1991) model formed the organising framework for the application of theory to this intervention.

Theoretical models of how young children learn and how this learning influences their health behaviour were used to address the predisposing, reinforcing and enabling factors that influence parents' and their children's pedestrian behaviour. Social Cognitive Theory (Bandura and Walters 1963) and the Health Belief Model (Janz and Becker 1984) formed the basis for most of the intervention components.

Social Cognitive Theory (SCT) suggests that environmental role models and societal expectations can significantly influence children's health behaviour (Bandura and Walters 1963). The operant techniques of reinforcement, chaining of behaviours and stimulus control which form part of SCT were key to the parent/carer intervention. A key operant technique, known as the *chaining of behaviours*, was used to assist parents and teachers to help the child develop more complex behaviours required when crossing a road. For this project 'chaining' comprised a sequence of five key road crossing behaviours discussed previously. The home and classroom learning activities applied several other educational techniques derived from this theory, including role modelling, observational learning, outcome expectancies, behavioural capability and self-efficacy related strategies (for example, goal setting, skills training and self-monitoring).

The home strategies were primarily based on the Health Belief Model (HBM) (Janz and Becker 1984) to target parents'/carers' readiness to take action to support their children in the road environment. According to this theory an individual's likelihood of taking action is related to his/her sense of threat from the health problem and his/her beliefs regarding the benefits and costs of engaging in the behaviour. All home intervention components were developed to systematically raise parents' awareness of their children's vulnerability. Consistent with the HBM, the home strategies concurrently motivate parents'/carers' mentoring and modelling of appropriate pedestrian crossing behaviours with their children. The intervention involves assisting parents to believe their children are at risk and the consequences of such are life threatening. Supportive cues for action are used to trigger parent/carer participation and to encourage them to believe that walking with their child, and actively teaching road crossing will reduce their child's risk of injury.

Theories related to children's maturational stages of development also informed the content and strategies used in the ECPIPP educational intervention. Child development theorists (Piaget and Inhelder 1956; Vygotsky 1962; Gibson 1979) suggest that learning occurs through the development and adaptation of specific skills in specific contexts and the subsequent generalisations they make from these experiences (Thompson 1996). Consistent with these theories the majority of the program's activities were directed toward opportunities for children to develop, practise and reinforce specific pedestrian skills, in specific road-side contexts (real versus simulated) relevant to the children's experiences. Gibson's (Gibson 1979) Theory of Perceptual Motor Skills, for example, provides strong justification for children to learn road-crossing skills at the roadside. This theory suggests that judgements and motor responses may be best learned in the contexts in which they occur, or close re-creations of these.

Conclusion

This paper has provided a brief overview of the components of the ECPIPP '*Walk with Your Kids*' intervention research project. ECPIPP responds to strong recommendations for the need to engage younger children and their parents to engage in pedestrian safety education. It is designed to build on and extend evidence-based practice, particularly previous intervention research conducted the authors and others as part of the CPIPP project 1995-1997 (Cross, Howat et al. 1998). This research aims to build the capacity of parents and teachers to advocate for and enhance the impact of behavioural and environmental factors that have been identified as helping to support and protect children in the road environment.

The evidence-based intervention components attempt to systematically address some of the barriers that appear to discourage schools from involving parents in road safety education, including a lack of appropriate resources, time, poor appreciation of the benefits, and perceptions that parents may not be interested or motivated to be involved.

This project provides the resources, skills and opportunity to actively engage parents of young children in strategies to improve their children's and their own road safety through education and advocacy. It will improve our understanding of the relative contribution of home/school-based interventions to improve pedestrian safety for young children as well as determine possible intervention strategies that may be used successfully by parents to support and enhance their children's pedestrian safety.

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*Principal investigators***:** Donna Cross; Margaret Hall; Peter Howat and Greg Hamilton

*Project Director***:** Marnie House

Author's contacts

Jill Darby Lecturer Public Health

School of Exercise, Biomedical & Health Sciences

Edith Cowan University Joondalup Campus

Building 19 -100 Joondalup Drive

Western Australia 6027

Tel: +61 8 6304 5081

Email: j.darby@ecu.edu.au

Child Health Promotion Research Unit

School of Exercise, Biomedical and Health Sciences

Edith Cowan University Churchlands Campus

Building 18 - Pearson Street Churchlands

Western Australia 6018

Tel +61 8 9273 8175

Fax +61 9 9273 8799

chpru@ecu.edu.au