A systematic review on the effectiveness of school and community-based injury prevention programmes on risk behaviour and injury risk in 8-12 year old children

Nauta J, van Mechelen W, Otten RH, Verhagen EA

CRD summary
This review concluded that short-term effects for school- and community-based interventions using safety devices for eight to 12 year olds were promising but sustainability of effects was unclear. Further research was recommended. The authors' conclusions and recommendations for further research are appropriate given the limitations of the included studies.

Authors' objectives
To evaluate the effectiveness of school- and community-based interventions targeting physical activity-related behaviours among eight to 12 year old children

Searching
The authors searched CINAHL, unspecified Cochrane databases, EMBASE, PubMed and SPORTDiscus for studies published in English in a peer-reviewed journal between 1 January 2000 and 28 April 2011. Search terms were presented. All relevant reviews identified and personal files of the research team were searched for further studies.

Study selection
Eligible studies needed to be of healthy children with a mean age at baseline between eight and 12 years of age. The intervention had to involve a school-based or community-based physical activity-related injury prevention study. The outcome of interest was number of injuries and/or safety behaviour.

Most studies were conducted in USA; some took place in Great Britain, The Netherlands and Australia. Most studies evaluated use of safety devices such as bicycle helmets and visibility aids. Some studies addressed pedestrian safety or physical activity-related injury prevention. Outcomes included safety knowledge, self-reported safety behaviour, observed safety behaviour, injury incidence and injury severity.

Two authors were involved in the selection of studies for the review. Any disagreements were resolved through consultation with a third reviewer.

Assessment of study quality
Methodological quality was assessed independently by two reviewers using the Downs and Black checklist of 27 items under five subscales: reporting, external validity, internal validity (bias and confounding) and study power. Study power was excluded from the quality assessment in this review. Scores were expressed as a percentage; studies that scored above 70% were deemed high quality.

Data extraction
One reviewer extracted data from the studies.

Methods of synthesis
A narrative synthesis was conducted.

Results of the review
Eleven studies (at least 13,810 participants) were included in the review: seven were cluster randomised trials, three had a time trends design and one a stepped wedge (where the intervention was given to three different schools over a week). Study quality ranged from 26% to 78%. Four studies had a quality score above 70% and were considered high quality. Ten studies lacked a conceptual framework to underpin the intervention. Methodological problems relating to bias included: unclear concealment of treatment allocation, lack of blinding of outcome assessors (blinding of participants not usually possible), loss to follow-up and inappropriate use of statistical tests. Follow-up varied between one week and two years and was less than one year in eight studies.
Four of seven studies showed improvement in observed or self-reported bicycle helmet use on completion of the intervention. Most of these were school-based. One further study, which included two intervention arms and a control group found no significant differences between those given a voucher for a free helmet after a paediatric emergency department visit and a group who received counselling only. However, the group whose helmet was fitted in the emergency department showed significant improvement in self reported helmet use compared to the group who received counselling only. Two studies did not show an improvement in either self-reported or observed safety use after the intervention. One study of visibility aids found children were more likely to use them one and eight weeks after the intervention that involved provision of the aids, posters and a letter to parents explaining their use. In effective interventions safety devices were distributed freely; in interventions that were not effective, vouchers were distributed or no devices were provided. Only one trial showed an improvement in safety device use despite not distributing the device during the intervention. Three studies with a follow-up of more than one year were all of low quality and showed inconsistent results.

Two trials of moderate quality found improvements in safety knowledge and street crossing behaviour after intervention. In one trial, retesting after three months showed safety knowledge was maintained but results for observed street crossing behaviour were not statistically significant.

One high quality study reported on a school-based physical activity-related injury prevention programme. Results showed no overall effect of the intervention on injury incidence and injury severity. The programme was more effective for children with low levels of habitual physical activity when compared to highly active children.

**Authors’ conclusions**
Short-term effects for school- and community-based interventions using safety devices for eight to 12 year olds were promising but sustainability of effects was unclear. Further high quality research was needed and should address actual physical activity injury reduction rather than safety behaviour change.

**CRD commentary**
This review was based on defined inclusion criteria and was underpinned by a search of several information sources. The restriction to studies published in English may have led to publication bias in that positive studies are more likely to be published. The authors assessed study quality and results were interpreted in the context of quality, highlighting the shortcomings of the included studies. More than one reviewer was involved in study selection and quality assessment to minimise bias and errors; only one reviewer appeared to be involved in data extraction. A narrative synthesis was appropriate given the diversity of the studies.

The authors’ conclusions and recommendations for further research are appropriate given the limitations of the included studies.

**Implications of the review for practice and research**
**Practice:** Results were mostly for school-based studies and may not be generalisable to studies in other settings. Results were mostly based on bicycle helmet use and may not be generalisable to other safety devices. The literature suggested that interventions needed to take into account not just the cost of a bicycle helmet but the effort involved in purchasing one. Evidence of their use in the context of bicycle helmet legislation was inconclusive. Children with low levels of habitual physical activity were at increased injury risk and injury prevention programmes should be designed to reach these children and cover leisure time activity outside the organised sports setting.

**Research:** Studies with a longer follow-up were needed to evaluate sustainability of interventions. Compliance with the intervention should be investigated. Shortcomings in statistical analysis should be addressed in future trials. There was a need to investigate the role of these interventions in reducing injury incidence.

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