
What works in preventing unintentional injuries in children and young adolescents: an updated systematic review

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Authors' objectives

To update the evidence relating to the effectiveness of childhood injury prevention.

Searching

The authors reported that a database of primary studies has been built up over the years. Relevant literature were identified by searching BIDS, MEDLINE, Excerpta Medica, the DHSS database, the Social Science Research Index, ISI Web of Science, and Transport Research Laboratory databases. In addition, subject experts were contacted, relevant journals were handsearched, and the reference lists of recently published books and articles were checked. No language restrictions were reported.

Study selection

Study designs of evaluations included in the review

Study inclusion was not restricted by design.

Specific interventions included in the review

Studies which included interventions that related solely or in part to the prevention of unintentional injuries were eligible. The studies could describe primary prevention measures designed to prevent accidents, or secondary measures designed to reduce the impact of accidents. Violence prevention studies were excluded, except where they were combined with unintentional injury studies.

The interventions addressed in the included studies were grouped under the following headings: road environment, home environment, leisure environment (i.e. prevention of leisure injuries), broader community-based interventions, and mass media. Road environment interventions were aimed at traffic calming, skills training, promotion of bicycle helmets, bicycle helmet legislation and seat belt legislation. Home environment interventions were aimed at the prevention of general home accidents, the prevention of burns and scalds, and the prevention of poisoning.

Participants included in the review

Studies targeting children aged 0 to 14 years were eligible.

Outcomes assessed in the review

The studies had to include an outcome measure, e.g. changes in mortality or morbidity, observed or reported behaviour, change in hazard, or change in knowledge.

How were decisions on the relevance of primary studies made?

The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality

CRD guidelines (see Other Publications of Related Interest no.1) were used to assess the quality of the evidence. The studies were graded on a 5-point scale: good, good/reasonable, reasonable, reasonable/weak and weak. Three reviewers independently assessed the quality of the evidence for each study. Any disagreements were resolved by consensus; a fourth reviewer was consulted if necessary.

Data extraction

Two reviewers extracted the data from each study using a standard data extraction form. The form included sections on

the aims and objectives of the intervention, the content of the intervention, setting, methods employed, and documented factors for the success and weakness of the intervention. Data were extracted on the aims and objectives, study design, sample size, outcome, impact and process measures.

Methods of synthesis

How were the studies combined?

A narrative synthesis was undertaken. The study findings were summarised in tables, each of which was accompanied by a commentary on the evidence of effectiveness. The studies were grouped into seven tables: pedestrian injuries, bicycle injuries, car occupant injuries, injuries in the home environment, injuries in the leisure environment, mass media and training, and community-based injury prevention programmes.

How were differences between studies investigated?

The studies were grouped according to the type of intervention addressed in the study.

Results of the review

Forty-two publications, which were not included in the authors' previous reviews (see Other Publications of Related Interest nos.2-3), were identified. Eight of the included studies were randomised controlled trials.

The quality of the evidence was rated as good/reasonable in 12 studies, reasonable in 13 studies and reasonable/weak in 17 studies.

A broad range of health promotion approaches were evaluated in the review and the interventions were targeted at a variety of different levels. A summary of the effectiveness of the different approaches is presented here; a more detailed evaluation of the included studies is presented in the full report.

The Road Environment.

Transport policies and the prevention of injuries (1 study): the authors noted that there was a paucity of studies on the effectiveness of policy level interventions to reduce injuries in the road environment. There was some evidence that school-crossing patrols have reduced road traffic accidents. More evidence in this area is needed.

Traffic calming/area-wide engineering measures (6 studies): there was good evidence that area-wide engineering schemes and traffic calming measures reduced accidents. The studies showed that vulnerable road users (i.e. pedestrians and cyclists) benefited from such schemes. In addition, area-wide engineering schemes were shown to be cost-effective. More research is needed to support the finding that cycle tracks reduce some cycle injuries.

Pedestrian skills training (10 studies): these programmes were shown to improve children's skills, both for individual skills such as timing and finding safe places to cross and a combination of skills, provided that they were specifically targeted. However, no studies have shown that pedestrian skills training has reduced children's injuries.

Pedestrian education (5 studies): school-based traffic club programmes were not shown to be effective. However, children's traffic clubs, using age-paced materials to promote parental teaching, have shown good evidence of behavioural change in parents and children. More evidence is needed to support the finding that children's traffic clubs reduce casualties.

Other traffic education (7 studies): road safety programmes that combined education and environmental measures in an integrated package showed some potential, but more research is required. One study showed that young people (11 to 18 years) were hard to reach and some methods may even be harmful.

Bicycle skills training (3 studies): there was some evidence that bicycle training schemes can improve safe riding behaviour.

Promotion of bicycle helmets (18 studies): bicycle helmet education campaigns were shown to increase the use of helmets. Reducing the cost of helmets appeared to facilitate uptake and use. A number of studies reported more success

with younger children and girls.

Bicycle helmet legislation: cycle helmet legislation was associated with injury reduction, though more evidence is needed. Cycle helmet legislation was shown to discourage child and teenage cyclists in a series of studies. Legislation with supporting educational activity was shown to be an effective way of increasing the observed helmet use.

Child restraint loan schemes (9 studies): the loan of car safety seats appeared to be an effective strategy for increasing the numbers of children transported safely in cars.

Educational campaigns to increase child restraint and seat belt use (16 studies): educational approaches appeared to be effective for increasing the number of babies and children restrained in cars. More intensive programmes seemed to be associated with more positive results. The programmes may be less effective in some groups, in particular teenagers.

Child restraint and seat belt legislation (9 studies): legislation requiring the restraint of children in cars was associated with reductions in injury and death. Legislation increased the number of children observed using restraints, although legislation alone may not achieve high levels of restraint use.

Enforcement of legislation (5 studies): police enforcement of car occupant restraint laws has achieved some increases in observed restraint use.

The Home Environment.

Prevention of general home accidents (11 studies): there was little evidence that campaigns to prevent general home accidents led to any reduction in injuries in young children. There was some evidence that such campaigns may lead to environmental and behavioural change.

Other specific home accidents (2 studies): there was limited evidence that campaigns were associated with reductions in injury; more evidence in this area is needed.

Prevention of burns and scalds (16 studies): educational campaigns were partially effective in increasing knowledge of burn and scald prevention. However, there was little evidence that these approaches have achieved reductions in burn and scald injuries. Programmes involving the distribution of smoke alarms seemed to be an effective means of achieving reductions in fire injuries. There was little evidence that campaigns to reduce domestic hot water temperatures were effective.

Burn legislation and regulations (3 studies): improved product design was shown to be effective in reducing specific burn and scald injuries. More evidence is needed of legislation relating to smoke alarms and hot water heaters.

Prevention of poisoning by educational interventions (5 studies): There was evidence to show that interventions to increase the safe storage of non-medicinal poisons may be an effective way to prevent poisoning, but more research is needed. Educational interventions aimed at children and parents were associated with increased knowledge of poison and poison prevention.

Prevention of poisoning by regulations (2 studies): though more research in this area is needed, there was evidence that child restraint packaging may be an effective means of reducing poison injury and death.

Other Environments.

Prevention of injuries in the leisure environment (7 studies): more evidence in this area is needed, but interventions to promote safety have been associated with positive results and reductions in the number of injuries. For example, playground hazards have been reduced following school-based interventions.

Mass media and training interventions (5 studies): there was no evidence that general mass media or training events led to a reduction in child injuries. However, these approaches have been shown to increase safety knowledge.

Community-based childhood injury prevention programmes (10 studies): a number of important elements of community-based approaches were identified. These included: a long-term strategy; effective, focused leadership; multi-

agency collaboration; the involvement of the local community; appropriate targeting; and the time to develop a range of local networks and programmes. The use of local surveillance systems was shown to be essential to target and evaluate interventions, and to motivate participants.

Authors' conclusions

A concerted attempt to implement established, effective interventions at the local, national and international level is essential to reduce the enormous burden of childhood injury.

CRD commentary

The methodological quality of the review was generally very good. The authors posed a suitable review question and the search was comprehensive. It is highly unlikely that any important studies were missed. The data extraction and quality assessment processes were reported, as were the number of reviewers who carried them out, and the authors used published guidelines to assess the quality of the included studies. The data were presented clearly in tables and the text, and the study results were summarised in a narrative manner. This review presented a comprehensive and high-quality overview of the world literature on the prevention of childhood injuries. The authors' conclusions follow from the data presented. Previous and associated papers are listed (see Other Publications of Related Interest).

Implications of the review for practice and research

Practice: The authors state that the synergistic effect of a number of approaches needs to be stressed, and the methods for education and training need to be appropriate for the target group. The encouragement of widespread use of safety equipment (e.g. bicycle helmets, car safety seats) can be reinforced by reducing costs and increasing availability. Legislation requires public acceptance and should include educational campaigns.

The authors state that policy makers should make it a high priority to increase the number of evaluated studies in which deprived groups or neighbourhoods are targeted.

Research: The authors state that there is a need for more well-designed and well-evaluated studies. Particular gaps in the evidence include: studies targeting young adolescents (especially 12- to 14-year-olds); studies in areas of sport and leisure injuries; studies targeting professional and policy makers; comparative studies employing the same research design in different countries; and studies employing behavioural methods. The need for more evidence was particularly noted for the following prevention measures: school-crossing patrols; cycle tracks; prevention of specific home accidents; legislation relating to smoke alarms and hot water heaters; interventions to increase the safe storage of non-medicinal poisons; child restraint packaging to reduce poison injury and death; and interventions to promote safety in the leisure environment.

Funding

NHS Executive National R&D Programme in Mother and Child, grant number MCH 10-21.

Bibliographic details

Towner E, Dowswell T, Mackereth C, Jarvis S. What works in preventing unintentional injuries in children and young adolescents: an updated systematic review. London: Health Development Agency. 2001

Other publications of related interest

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Indexing Status

Subject indexing assigned by CRD

MeSH

Accident Prevention; Adolescent; Child; Child, Preschool; Health Education; Infant; Wounds and Injuries /prevention & control

AccessionNumber

12003008511

Date bibliographic record published

30/11/2003

Date abstract record published

30/11/2003

Record Status

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