Safety education of pedestrians for injury prevention (Review)

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This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2012, Issue 4

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[Intervention Review]

Safety education of pedestrians for injury prevention

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Editorial group: Cochrane Injuries Group.
Publication status and date: Edited (no change to conclusions), published in Issue 4, 2012.
Review content assessed as up-to-date: 23 February 2005.

Citation: Duperrex O, Roberts I, Bunn F. Safety education of pedestrians for injury prevention. *Cochrane Database of Systematic Reviews* 2002, Issue 2. Art. No.: CD001531. DOI: 10.1002/14651858.CD001531.

ABSTRACT

Background

Each year about one million people die and about 10 million are seriously injured on the world's roads. Educational measures to teach pedestrians how to cope with the traffic environment are considered to be an essential component of any prevention strategy, and pedestrian education has been recommended in many countries. However, as resources available for road safety are limited, a key question concerns the relative effectiveness of different prevention strategies.

Objectives

To quantify the effectiveness of pedestrian safety education programmes in preventing pedestrian-motor vehicle collisions.

Search methods

We searched the Cochrane Injuries Group's Specialised Register, Cochrane Controlled Trials Register, TRANSPORT, MEDLINE, EMBASE, ERIC, PSYCHLIT, SPECTR, and the WHO database on the Internet. We checked reference lists of relevant reviews and papers and contacted experts in the field. Most database searching was conducted in 1999, and updated in May 2003.

Selection criteria

Randomised controlled trials of safety education programmes for pedestrians of all ages.

Data collection and analysis

One author screened records. Two authors independently extracted data and assessed methodological quality of trials. Because of differences in the types of interventions and outcome measures used in the trials, meta-analyses were not carried out.

Main results

We found 15 randomised-controlled trials of pedestrian safety education programmes, conducted between 1976 and 1997. The methodological quality of the included trials was generally poor. Allocation concealment was adequate in three trials, outcome assessment was blinded in eight, and in most of the studies large numbers of participants were lost to follow up. Study participants were children in 14 studies and institutionalised adults in one. Eight studies involved direct education of participants, seven used parents as educators. No trials were conducted in a developing country and there were none of pedestrian safety training in the elderly. None of the trials assessed the effect of pedestrian safety education on the occurrence of pedestrian injury, but six assessed the effect on observed behaviour.

Some trials showed evidence of behavioural change following pedestrian safety education but it is difficult to predict what effect this might have on pedestrian injury risk.

Authors' conclusions

Pedestrian safety education can result in improvement in children's knowledge and can change observed road crossing behaviour, but whether this reduces the risk of pedestrian motor vehicle collision and injury occurrence is unknown. There is evidence that changes in safety knowledge and observed behaviour decline with time, suggesting that safety education must be repeated at regular intervals.

PLAIN LANGUAGE SUMMARY

Pedestrian safety education for children can improve their knowledge and change their road crossing behaviour, but effects on injury are unknown

A major proportion of the people killed or seriously injured in road traffic crashes are pedestrians, and children are particularly vulnerable. Education programmes try to teach people how to cope with the road environment. Parents are sometimes used as educators. The review of trials (mostly in children) found that pedestrian safety education can improve children's road safety knowledge and their observed road crossing behaviour. Education may need to be repeated at regular intervals, as the effect can decline with time. However, whether these changes to knowledge or behaviour can be linked to a reduction in pedestrian deaths and injuries is unknown.

BACKGROUND

Road traffic crashes are now the leading cause of death and disablement for people aged 3 to 35 years, killing each year about one million people and seriously injuring about 10 million people (Murray 1996). The global economic burden of road traffic crashes is estimated at US$500 billion (www.worldbank.org). Most of the casualties are in low and middle-income countries (LMIC), and most are vulnerable road users: pedestrians, cyclists and riders of motorised two wheelers. Most of pedestrian casualties are children and elderly (Barss 1998; Murray 1996; Rivara 1990).

In the prevention of pedestrian injuries, educational measures to teach pedestrians how to cope with the traffic environment are considered to be an essential component of any prevention strategy and pedestrian education has been recommended in high, middle and low-income countries (World Bank 2001). Because the resources available for road safety are limited, a key question for road safety policy concerns the relative cost-effectiveness of different prevention strategies. Resources allocated to pedestrian education programmes become unavailable for other prevention strategies, such as environmental strategies. A New Zealand study estimated that if the same amount of resources that were allocated to pedestrian safety education were allocated to traffic calming, on the basis of estimates of the effectiveness of traffic calming there would be 18 fewer child pedestrian hospitalisations in New Zealand each year (Roberts 1994). Several reviews have been carried out on injury prevention topics including pedestrian-motor vehicle collisions (Avery 1982; Berger 1975; Dowswell 1996; Ehrlich 1982; Forjuoh 1996; Malek 1990; Munro 1995; OECD 1983; Phinney 1985; Rivara 1990; Smith 1983; Towner 1996; Tripp 1938; Wazana 1997). However, these reviews included both randomised and non-randomised trials and may have missed unpublished trials and trials reported in languages other than English. The aim of this systematic review of randomised controlled trials was to quantify the effectiveness of pedestrian education programmes in improving pedestrian knowledge, attitudes and behaviour, and most importantly, in preventing pedestrian-motor vehicle collisions.

OBJECTIVES

- To quantify the effectiveness of pedestrian education programmes in preventing pedestrian-motor vehicle collisions.
- To quantify the effectiveness of pedestrian education programmes in changing behaviour, attitude and knowledge of pedestrians.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials.

Types of participants

Pedestrians of all ages.

Types of interventions

Pedestrian safety education programmes. Community-based interventions such as media awareness campaigns and parental education programmes were also included. Studies of education aimed at modifying the behaviour of drivers towards pedestrians were not included.

Type of comparison of interventions in eligible studies:

- pedestrian safety education vs no intervention;
- pedestrian safety education vs intervention A;
- pedestrian safety education + intervention A vs intervention A;
- pedestrian safety education + intervention A vs intervention A + intervention B.

Intervention A and B can be an educational intervention unrelated to the prevention of pedestrian injuries; for example, home safety education or a pedestrian safety intervention that does not involve pedestrian education, such as traffic calming.

Studies where pedestrian safety education is confounded by another intervention were not included e.g. pedestrian safety education + intervention A vs intervention B.

Types of outcome measures

- Pedestrian injury (fatal and non-fatal).
- Pedestrian-motor vehicle collisions.
- Behaviour, attitude and knowledge of pedestrians.

Search methods for identification of studies

Electronic searches

Searches were conducted on transport, educational and medical databases.

The following electronic databases were searched:

- Cochrane Injuries Group's specialised register (see Review Group's details for more information);
- Cochrane Controlled Trials Register (2000, issue #4);
- TRANSPORT (1968-11/98) which includes 3 databases from the Transportation Research Board (Transport Research Information Services - TRIS), from the Organisation for Economic Co-operation and Development (International Road Research Documentation - IRRD) and from the European Conference of Ministers of Transport (TRANSDOC);
- MEDLINE (1966-5/99);
- EMBASE (1980-1/99);
- ERIC (1992-9/98);
- PSYCLIT (1898-12/1998);
- SPECTR (7/2000);
- WHO database available on Internet (1/2001).

Details of the search strategy can be found in Appendix 1. The search was updated in May 2003.

Searching other resources

Further potential trials were identified by checking the reference lists of relevant reviews, books and articles, contacting authors of relevant papers, use of the citation analysis facility of SCI and SSCI, contacting professionals, organisations and voluntary agencies with an interest in road safety. The JANCOC (Japanese informal network for the Cochrane Collaboration) mailing list and some Japanese specialists were contacted by e-mail or letter. The protocol for this review was presented at the 33^{rd} session of the UN Working Party on Road Traffic Safety (1/10/1999) in Geneva. The United Nations Economic Commission for Europe Working Party on Road Traffic Safety brings together the governmental road safety organisations of 55 member countries throughout Europe. Working Party officials were asked to provide information on any published or unpublished controlled trials of pedestrian safety education that were available to them.

Data collection and analysis

Selection of studies

All records identified by searching electronic databases were screened for eligibility by one reviewer (OD) and the full text of all potentially eligible studies were obtained for assessment. Two reviewers (OD, FB) independently extracted data on injuries, pedestrian−motor vehicle collisions, behaviour, attitude and knowledge, methods of randomisation and numbers lost to follow up. Disagreement was resolved by discussion with a third reviewer (IR).

Assessment of risk of bias in included studies

Since there is evidence that the quality of allocation concealment particularly affects the results of studies (Schulz 1995), two reviewers (OD, FB) evaluated the risk of bias according to the definition in Chapter 8.5 of the Cochrane Handbook (Higgins 2011) as shown below, assigning 'high risk' of bias to poorest quality and 'low risk' of bias to best quality:

- Low risk: trials deemed to have taken adequate measures to conceal allocation (i.e. central randomisation; numbered or

coded bottles or containers; drugs prepared by the pharmacy; serially numbered, opaque, sealed envelopes; or other description that contained elements convincing of concealment);

- Unclear risk: trials in which the authors either did not report an allocation concealment approach at all or reported an approach that did not fall into one of the other categories;
- High risk: trials in which concealment was inadequate (such as alternation or reference to case record numbers or to dates of birth).

Where the method used to conceal allocation was not clearly reported, the author was contacted, if possible, for clarification. We then compared the scores allocated and resolved differences by discussion.

When assessing trial quality, the reviewers were not blinded to the names of the authors, institutions, journal of publication or results of the trials, because evidence for the value of this is inconclusive (Berlin 1997).

Measures of treatment effect

Wherever possible, an intention-to-treat analysis was performed. Because of the differences in the types of interventions and the types of outcomes meta-analysis was not considered appropriate. For all studies, we report the results provided by the authors in the text and used the METAVIEW facility in Review Manager (RevMan) to show the results of each individual trial graphically. The outcomes are expressed as positive expected behaviour, attitude or knowledge. For dichotomous outcomes, relative risks (RR) and risk differences (RD) with their 95% confidence intervals (CIs) were calculated using Review Manager (RevMan). For continuous outcomes, results are reported as standardised mean difference (SMD) and weighted mean difference (WMD) with their 95% confidence intervals (CI). If the variance for the change score was not presented and could not be obtained from the authors, this was imputed using a correlation factor between pre- and post-test of r=0.50 (Mulrow 1997; Follmann 1992). In the graphical presentation of results, we report the post-test data and the change between pre-test and post-test whenever possible, grouped by age groups and by type of outcomes (behaviour, attitude, knowledge). For cluster randomised trials, an effective sample size was calculated based on the inter-cluster coefficient if this was available (Donner 1993). Studies in which there were less than five randomised clusters were excluded, because of the interpretational difficulties caused by the total confounding of two sources of variation: the variation in response due to the effect of intervention, and natural variation that exists between the clusters even in the absence of an intervention effect. Measuring and adjusting for baseline differences can help reduce such confounding, but the inherent problem that such trials can only be analysed at the level of the individual remains. To analyse at the individual level, one would have to assume that there was no clustering of individual responses within the community, which is almost always untenable (Donner 2000).

Assessment of reporting biases

We were unable to conduct the planned examination of the impact of small study bias by conducting funnel plots and using statistical tests for funnel plot asymmetry (Egger 1997). The following hypotheses were specified a priori as factors that might explain heterogeneity between the results of the included trials but were not explored:

- participants: children versus adults;
- setting: high-income versus low and middle income countries;
- trial quality: adequately versus inadequately concealed.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

Results of the search

Of the 13,899 published and unpublished studies identified by our original search strategies, 674 (5%) were potentially relevant, based on title or abstract. After full text review, 15 trials met our inclusion criteria (Ampofo-Boateng 1993; Bouck 1992; Cross 1988; Downing 1981; Limbourg 1981; Luria 2000; Matson 1980; Miller 1982; Nishioka 1991; Renaud 1989; Singh 1979; Thomson 1992; Thomson 1997a; Thomson 1997b; Thomson 1998).

Included studies

The study participants were children in 14 studies and institutionalised adults in one (Matson 1980). Eight studies involved the direct education of study participants (Ampofo-Boateng 1993; Cross 1988; Luria 2000; Matson 1980; Nishioka 1991; Renaud 1989; Thomson 1992; Thomson 1998), seven involved the use of parents (Downing 1981; Limbourg 1981; Thomson 1997a; Thomson 1997b) or teachers (Bouck 1992; Miller 1982; Singh 1979) as educators. Pedestrian safety education was given at home in two studies (Downing 1981; Limbourg 1981), in the classroom in four studies (Cross 1988; Miller 1982; Renaud 1989; Singh 1979), in a semi-real traffic environment in one study (Nishioka 1991), in the classroom and a semi-real traffic environment in three studies (Bouck 1992; Luria 2000; Matson 1980), and in the classroom and the real traffic environment in five studies (Ampofo-Boateng 1993; Thomson 1992; Thomson 1997a; Thomson 1997b; Thomson

1998). The outcomes were measured both before and after the intervention in 12 studies (Ampofo-Boateng 1993; Cross 1988; Downing 1981; Limbourg 1981; Luria 2000; Matson 1980; Miller 1982; Singh 1979; Thomson 1992; Thomson 1997a; Thomson 1997b; Thomson 1998) and after intervention in three studies (Bouck 1992; Nishioka 1991; Renaud 1989).

Excluded studies

We excluded one randomised controlled trial (RCT) because the number of clusters was less than five (Cross D 2000), two RCTs because they compared pedestrian safety education methods without control group (Dueker 1975; McKelvey 1978), two RCTs without a pedestrian education component (Kelly 1987; Stuy 1993) and 35 studies involving a control group but without a random allocation process (details available in Characteristics of excluded studies). Two of the excluded studies provided data on accident/injury rates (Schioldborg 1976; Ytterstad 1995) but did not use a random allocation.

Risk of bias in included studies

The methodological quality of the included trials was generally poor. The method of allocation concealment was adequate in only three trials (Downing 1981, Miller 1982, Nishioka 1991), outcome assessment was blinded in eight (Ampofo-Boateng 1993, Cross 1988, Limbourg 1981, Luria 2000, Matson 1980, Thomson 1992, Thomson 1997a, Thomson 1998) and in most of the studies large numbers of participants were lost to follow up.

Ampofo-Boateng 1993 (some information obtained from author): Study participants were individually allocated from the class register in alphabetic order (with separate lists for boys and girls) to intervention or control groups by alternation. Outcome assessment was blind to intervention allocation. Loss to follow-up was 37.5% for the intervention groups. Inter-rater reliability was 0.89 for coding.

Bouck 1992 (some information obtained from author): Children were selected to participate in the study from their class lists by drawing lots from a basket. Then the selected children were allocated to intervention or control groups by again drawing lots from a basket . Outcome assessment was blind to intervention allocation. Loss to follow up was 20% in each group.

Cross 1988 (some information obtained from author): Children were allocated to a class by drawing lots from a hat. Then the classes were allocated to intervention or control groups by again drawing lots from a hat. No information was available on blinding of outcome assessment and loss to follow up.

Downing 1981 (some information obtained from author): Children were individually allocated to intervention or control groups by an on-site computer system. Outcome assessment was not blind to intervention allocation. Overall loss to follow-up was 44%, mostly because children had moved out of the area.

Limbourg 1981 (some information obtained from author): Schools were allocated by block randomisation within groups of four similar schools (matched for age, sex, parental social status and urban characteristics of living area). Paper cards were drawn from an envelope to allocate blocks to intervention or control groups. Outcome assessment was blind to intervention allocation. Overall loss to follow up was 15%.

Luria 2000 (some information obtained from author): Schools were allocated to intervention or control groups by identical folded pieces of paper drawn from a container. In each school, one class of 25 children was selected by randomisation to participate in the evaluation study. Outcome assessment was not blind to intervention allocation. Loss to follow-up was 26% for both groups, mostly because children were absent on post-test day or had moved out of the area.

Matson 1980: Triplets of individuals (matched for age, IQ, adaptive behaviour and deficits in pedestrian behaviour) were allocated by block randomisation. Outcome assessment was blind to intervention allocation. No information available for loss to follow-up.

Miller 1982 (some information obtained from author): Classrooms were allocated by a list of random numbers read by someone not involved in the trial (closed list). No information was available on blinding of outcome assessment. Overall loss to follow-up was 6% for knowledge test, 65% and 77% for reported behaviour (two questionnaires).

Nishioka 1991 (some information obtained from author): Triplets of individuals (matched for age, sex and class) were allocated by block randomisation using a table of random numbers. Outcome assessors were not blinded. Loss to follow up was 10%.

Renaud 1989 (some information obtained from author): Study participants were randomly allocated by alternation. Outcome assessment was not blind to intervention allocation. Author confirmed there was no loss to follow-up.

Singh 1979 (some information obtained from author): Study participants were randomly allocated to intervention or control groups by classroom. The method of randomisation and allocation concealment is not described. Outcome assessment was not carried out by the teachers who administered the intervention but by an interviewing team from the study organisers. It is not stated whether interviewers were blinded to study group. Number of classes lost to follow-up: in the intervention group two refused and seven did not complete (7/106=6.6%), and in the control group 33 refused but all the others completed.

Thomson 1992, Thomson 1997a, Thomson 1997b, Thomson 1998 (some information obtained from author): Study participants were individually allocated to intervention or control groups by alternation from the class register in alphabetic order (with separate lists for boys and girls). Outcome assessment was blind to intervention allocation. Author confirmed there was no loss to follow-up in any of the studies.

Effects of interventions

Results are presented in a narrative form below as well as graphically in METAVIEW. The outcomes are expressed as positive expected behaviour, attitude or knowledge. For the graphical presentation of the results, we report the post-test data for dichotomous and continuous outcomes and ,whenever possible, the change between pre-test and post-test for continuous outcomes, often after imputation of the variance of the change between pre and post-testing (Mulrow 1997, Follmann 1992).

Overall, the effect of safety education of pedestrians on behaviour varied considerably. The relative probability of trained pedestrians behaving correctly compared to non-trained ones ranged between 0.49 and 9.29 depending on the study and the outcome measured. Safety education of pedestrians improved the attitude / intentions with an effect ranging from a standardised mean difference of 0.17 to 1.48. Knowledge about road safety increased more in the trained groups than the non-trained ones when outcomes were measured before and after (standardised mean difference from 0.16 to 1.01), but for dichotomous outcomes the range of effect is wide (relative risk ranging from 0.72 to 1.66).

The observed behaviour of 3 to 4 years old children can be improved by indirect education, although the importance of the effect varies considerably depending on the outcome chosen and on the conditions of observation [Comparison Table 02/02]. With time, the potential benefit of indirect education seems to diminish [Comparison Table 02/03]. No information is available for effect on behaviour of direct education in this age group.

For children aged 5 to 7, the immediate (less than 1 month) evaluations show that their observed behaviour can be improved by direct as well as by indirect education, although the importance of the effect varies considerably depending on the outcome chosen and on the conditions of observation [Comparison Tables 01/03 & 02/03]. With time, the potential benefit of indirect education diminishes [Comparison Tables 02/05 & 02/06]. No information is available for long term effect on behaviour of direct education in this age group.

Direct and indirect education might have some positive impact on attitude of 7 to 9 years old pedestrian [Comparison Table 01/13]. No information is available for effect on behaviour of education in this age group.

Impact of educational programs on knowledge of children pedestrian is inconsistent across studies [Comparison Tables 01/22 & 01/26 & 02/20 to 02/29].

Details of indicial studies results are presented below.

Ampofo-Boateng 1993 assessed children's ability to choose a safe route for crossing the road. They reported the mean proportion of routes falling into different safety categories. Children were tested before training (PT), immediately after training (PT1), nine weeks after training (PT2) and eight months after training (PT3). For children trained in a real traffic environment, the proportion of chosen routes (standard deviations in brackets) classified as safe was: PT = 0.13 (0.20), PT1 = 0.72 (0.28), PT2 = 0.50 (0.36). For children trained with the tabletop model, the proportion of chosen routes (standard deviations in brackets) classified as safe was: PT = 0.07 (0.16), PT1 = 0.70 (0.30), PT2 = 0.54 (0.34). Children in the control group were only tested once, eight months after training. At eight months, the mean proportion of chosen routes classified as safe was 0.38 (0.23) in the trained groups (real and tabletop groups together) compared with 0.12 (0.15) in the control group – WMD 0.26 (95%CI: 0.09 to 0.43) (Table of Comparisons 01/12). In the trained group, the mean proportion of chosen routes classified as safe declined over time.

- [Table 01/12] - post-test 2:

Post-test proportion of routes categorised as Safe - (Table top & roadside training) versus No training: SMD 1.28 (0.30 to 2.26); WMD 0.26 (0.09 to 0.43)

Bouck 1992 reported the mean score (standard deviation) of a knowledge test conducted immediately after the intervention. The mean knowledge score was 83.3 (10.6) in the intervention group and 35.7 (25.3) in the control group.

- [Table 01/24] - Knowledge of 8 to 11 years old - post-test at less than 1 month

Post-test score of "Conspicuity, mass, speed and control" test (maximum score 100): SMD 2.39 (1.46 to 3.33); WMD 47.60 (34.16 to 61.04).

Cross 1988 reported the percentage of children with the correct understanding of the concept of speed before and after training for four set tasks.

- Task 1: In the intervention group (n=69), the proportion giving the wrong answer decreased from 78% (54) to 25% (17) between pre and post-testing whereas in the control group (n= 69), the proportion giving the wrong answer decreased from 80% (55) to 62% (43) between pre and post-testing.
- Task 2: In the intervention group (n=69), the proportion giving the wrong answer decreased from 36% (25) to 6% (4) between pre and post-testing whereas in the control group (n= 69), the proportion giving the wrong answer decreased from 29% (20) to 9% (6) following testing.
- Task 3: In the intervention group (n=69), the proportion giving the wrong answer decreased from 54% (37) to 10% (7) between pre and post-testing whereas in the control group (n= 69) the proportion giving the wrong answer decreased from 47% (33) to 35% (24) following testing.
- Task 4: In the intervention group (n=69), the proportion giving the wrong answer decreased from 27% (19) to 0% (0) between pre and post-testing whereas in the control group (n= 69), the proportion giving the wrong answer decreased from 20% (14) to 7% (5) following testing.

- [Table 01/13]: Apply "concept of speed": RR 1.27 (1.07 to 1.50) ; RD 0.19 (0.06 to 0.32).

Downing 1981 reported the percentage of three year old children correctly answering 18 questions relating to simple traffic knowl-

edge. The results were stratified according to whether or not the families were aware that they were taking part in an experiment. In the groups that were aware that they were taking part in an experiment, baseline information was collected from mothers and children during interviews. In the group that were unaware that they were taking part in an experiment no baseline information was collected.

In families that were aware they were taking part in an experiment:

- (a) when children were tested on simple traffic knowledge, the group that obtained the booklet showed greater improvement for 14 of the 18 items tested; the average increase (pre-post) in the percentage of children giving correct replies was 13% per item in the intervention group compared with an average improvement of 8% per item in the comparison group;
- (b) when children were tested on road safety rules both groups showed improvement for six of the seven items tested, without significant difference in the amount of improvement; the average increase (pre-post) in the percentage of children giving correct replies was 11% per item in the intervention group compared with an average improvement of 13% per item in the comparison group.

In families that were unaware they were taking part in an experiment:

- (a) when children were tested on simple traffic knowledge, the group that obtained the booklet performed better than the group that did not for 12 of the 18 items tested, but there was no difference on three items and the booklet group performed worse than the control group on four items. The average advantage of the intervention group over the control group was about 3% per item;
- (b) when children were tested on road safety rules, the group that received the booklet performed better than the group that did not on four of the seven items tested. The difference, however, was small, averaging about 3% per item.

- [Table 02/20] - Knowledge of 3 years old - post-test at 1 to 3 months

1. Hold hands - Road safety booklet after an interview versus Interview only: RR 0.72 (0.52 to 0.99); RD -0.13 (-0.26 to 0.00)
2. Hold hands - Road safety booklet with a letter versus No intervention: RR 1.13 (0.90 to 1.43); RD 0.04 (-0.03 to 0.12)
3. Walk / stay on pavement - Road safety booklet after an interview versus Interview only: RR 0.74 (0.44 to 1.24); RD -0.06 (-0.17 to 0.04)
4. Walk / stay on pavement - Road safety booklet with a letter versus No intervention: RR 1.24 (0.87 to 1.76); RD 0.04 (-0.02 to 0.10)
5. Look / watch out for cars - Road safety booklet after an interview versus Interview only: RR 1.66 (0.78 to 3.57); RD 0.06 (-0.03 to 0.14)
6. Look / watch out for cars - Road safety booklet with a letter versus No intervention: RR 1.33 (0.82 to 2.18); RD 0.03 (-0.02 to 0.08)

Limbourg 1981 reported the change in the proportion of children who were observed to stop at the kerb and to look right and left before crossing. The results were stratified according to whether or not children were deliberately distracted by the investigators at the time of road crossing. Children were divided into the following four groups: Group one (behavioural training by parent with psychologist supervision), Group two (behavioural training by parent without psychologist supervision), Group three (simple road safety information given to parents), Group four (behavioural training by parent with psychologist supervision). The percentage of children who behaved adequately was given for intervention (Groups one and two) and for control groups (Groups three and four).

The proportion of children aged 3 to 4 years old who stopped at kerb without being distracted were PT=4%, PT1=83%, PT2= 20% for the intervention group and PT=5%, PT1=43%, PT2= 15% for the control group.

The proportion of children aged 3 to 4 years old who stopped at kerb whilst being distracted were PT=8%, PT1=76%, PT2a= 15%, PT2b=19% for the intervention group and PT=6%, PT1= 8%, PT2a=8%, PT2b=9% for the control group.

- [Table 02/01] - Behaviour (observed) of 3 to 4 year olds - post-test at 1 to 3 months

1. Stop at kerb - no distraction: RR 1.96 (1.48 to 2.59); RD 0.41 (0.28 to 0.54)
2. Stop at kerb - distraction (competition): RR 9.29 (4.28 to 20.12); RD 0.68 (0.58 to 0.78)
3. Stop at kerb - distraction (alone): -
4. Stop at line of vision - no distraction: RR 2.00 (1.24 to 3.23); RD 0.22 (0.09 to 0.35)
5. Stop at line of vision - distraction (competition): RR 5.12 (1.89 to 13.88); RD 0.23 (0.13 to 0.32)
6. Stop at line of vision - distraction (alone): -
7. Stop & look at kerb - no distraction: RR 1.19 (0.82 to 1.71); RD 0.07 (-0.07 to 0.21)
8. Stop & look at kerb - distraction (competition): RR 3.84 (1.39 to 10.62); RD 0.16 (0.06 to 0.25)
9. Stop & look at kerb - distraction (alone): -
10. Stop & look at line of vision - no distraction: RR 1.44 (0.86 to 2.40); RD 0.10 (-0.03 to 0.22)
11. Stop & look at line of vision - distraction (competition): RR 4.70 (1.46 to 15.13); RD 0.15 (0.07 to 0.24)
12. Stop & look at line of vision - distraction (alone): -

- [Table 02/02] - Behaviour (observed) of 3 to 4 year olds - post-test at 4 to 6 months

1. Stop at kerb - no distraction: RR 1.27 (0.64 to 2.52); RD 0.04 (-0.08 to 0.16)

2. Stop at kerb - distraction (competition): RR 1.79 (0.73 to 4.43); RD 0.07 (-0.03 to 0.17)
3. Stop at kerb - distraction (alone): RR 2.20 (0.92 to 5.30); RD 0.10 (0.00 to 0.21)
4. Stop at line of vision - no distraction: RR 1.07 (0.45 to 2.52); RD 0.01 (-0.09 to 0.11)
5. Stop at line of vision - distraction (competition): RR 1.92 (0.38 to 9.62); RD 0.03 (-0.03 to 0.09)
6. Stop at line of vision - distraction (alone): RR 1.40 (0.49 to 3.99); RD 0.03 (0.06 to 0.12)
7. Stop & look at kerb - no distraction: RR 0.99 (0.48 to 2.04); RD 0.00 (-0.12 to 0.11)
8. Stop & look at kerb - distraction (competition): RR 0.90 (0.32 to 2.55); RD -0.01 (-0.09 to 0.08)
9. Stop & look at kerb - distraction (alone): RR 1.17 (0.44 to 3.12); RD 0.01 (-0.08 to 0.10)
10. Stop & look at line of vision - no distraction: RR 1.71 (0.62 to 4.70); RD 0.05 (-0.04 to 0.14)
11. Stop & look at line of vision - distraction (competition): RR 0.77 (0.20 to 2.97); RD -0.01 (-0.08 to 0.06)
12. Stop & look at line of vision - distraction (alone): RR 0.49 (0.17 to 1.42); RD -0.06 (-0.15 to 0.03)

The proportion of children aged 5 to 6 years old who stopped at kerb without being distracted were PT=14%, PT1=82%, PT2= 31% for the intervention group and PT=9%, PT1=56%, PT2= 29% for the control group.

The proportion of children aged 5 to 6 years old who stopped at kerb whilst being distracted were PT=16%, PT1=80%, PT2a= 21%, PT2b=28% for the intervention group and PT=11%, PT1= 13%, PT2a=10%, PT2b=17% for the control group.

- [Table 02/05] - Behaviour (observed) of 5 to 7 year olds - post-test at 1 to 3 months

1. Stop at kerb - no distraction: RR 1.47 (1.27 to 1.70); RD 0.26 (0.17 to 0.35)
2. Stop at kerb - distraction (competition): RR 6.21 (4.24 to 9.09); RD 0.67 (0.59 to 0.75)
3. Stop at kerb - distraction (alone): -
4. Stop at line of vision - no distraction: RR 1.54 (1.26 to 1.88); RD 0.23 (0.13 to 0.33)
5. Stop at line of vision - distraction (competition): RR 5.10 (3.30 to 7.89); RD 0.44 (0.35 to 0.53)
6. Stop at line of vision - distraction (alone): -
7. Stop & look at kerb - no distraction: RR 1.04 (0.85 to 1.27); RD 0.02 (-0.09 to 0.12)
8. Stop & look at kerb - distraction (competition): RR 4.65 (2.99 to 7.23); RD 0.39 (0.30 to 0.48)
9. Stop & look at kerb - distraction (alone): -
10. Stop & look at line of vision - no distraction: RR 1.40 (1.15 to 1.70); RD 0.18 (0.08 to 0.28)
11. Stop & look at line of vision - distraction (competition): RR 3.98 (2.54 to 6.24); RD 0.32 (0.23 to 0.41)
12. Stop & look at line of vision - distraction (alone): -

- [Table 02/06] - Behaviour (observed) of 5 to 7 year olds - post-test at 4 to 6 months

1. Stop at kerb - no distraction: RR 1.09 (0.78 to 1.53); RD 0.03 (-0.08 to 0.13)
2. Stop at kerb - distraction (competition): RR 2.04 (1.18 to 3.54); RD 0.11 (0.03 to 0.19)
3. Stop at kerb - distraction (alone): RR 1.67 (1.09 to 2.55); RD 0.11 (0.02 to 0.20)
4. Stop at line of vision - no distraction: RR 2.84 (1.78 to 4.53); RD 0.22 (0.13 to 0.31)
5. Stop at line of vision - distraction (competition): RR (1.70 to 6.64); RD 0.14 (0.07 to 0.22)
6. Stop at line of vision - distraction (alone): RR 2.00 (1.30 to 3.10); RD 0.15 (0.06 to 0.24)
7. Stop & look at kerb - no distraction: RR 1.17 (0.81 to 1.67); RD 0.04 (-0.06 to 0.14)
8. Stop & look at kerb - distraction (competition): RR 2.41 (1.30 to 4.49); RD 0.11 (0.04 to 0.18)
9. Stop & look at kerb - distraction (alone): RR 1.56 (0.98 to 2.48); RD 0.13 (0.04 to 0.23)
10. Stop & look at line of vision - no distraction: RR 1.79 (1.18 to 2.72); RD 0.13 (0.04 to 0.23)
11. Stop & look at line of vision - distraction (competition): RR 2.80 (1.39 to 5.64); RD 0.11 (0.04 to 0.18)
12. Stop & look at line of vision - distraction (alone): RR 1.62 (0.99 to 2.66); RD 0.08 (0.00 to 0.16)

Luria 2000 assessed the change in children's knowledge on how to cross the street (maximum score 16 points).

The intervention group improved their mean score from 4.31 to 6.21 and control group from 4.27 to 5.63.

- [Table 01/22] - Post-test score of "Crossing the street" test (maximum score 16): SMD 0.23 (-0.07 to 0.52); WMD 0.58 (-0.16 to 1.32)

The mean change (standard deviation) between pre- and post-tests was 1.9 (2.7) for intervention group and 1.4 (3.5) for control group.

- [Table 01/26] - Change in score of "Crossing the street" test (maximum score 16): SMD 0.16 (-0.13 to 0.45); WMD 0.50 (-0.41 to 1.41)

Matson 1980 examined the effect of pedestrian skills training in 30 'mentally retarded' institutionalised adults. Study participants were randomly allocated to one of three groups. These were individualised classroom training involving the practice of correct pedestrian behaviour using movable figures on a scale model of an intersection (n=10), independence training using a mock up of an intersection on the hospital grounds (n=10) and a control group receiving a non-road safety educational intervention (n= 10). Assessment was carried out at a city intersection before and after the three month treatment period. Each trial participant was asked to perform a target behaviour which was graded on the basis of whether or not the target behaviours were performed correctly

and if they were in the proper sequence. Prior to the intervention, the percentage of the steps performed correctly for the classroom training, independence training and control groups were 34%, 25% and 17% respectively. Following the intervention, the percentage of the steps performed correctly for the scale figure taught, hospital intersection taught and control groups were 77%, 90% and 16%. These figures were obtained from a graph.

- [Table 01/08] - Post-test mean proportion of steps correct at city intersection (13 steps/person * 10 persons = 130 steps):

classroom versus control: RR 1.91 (1.23 to 2.98); RD 0.16 (0.06 to 0.27)
"independence" versus control: RR 1.43 (0.89 to 2.30); RD 0.08 (-0.02 to 0.18)

Miller 1982 reported changes in safety knowledge and parentally reported safety behaviour in 550 second grade students in a cluster randomised controlled trial of the Beltman traffic safety programme. Teachers were randomised to one of three groups: Beltman traffic safety training, Beltman traffic safety training with two booster lessons four months following training and control group. Children's safety knowledge was assessed in a 20-item multiple choice test. Prior to the intervention the mean test scores (standard deviation) in the three groups were 13.22 (3.06) in the Beltman group, and 13.40 (3.11) in the Beltman with Booster group and 13.74 (3.21) in the control group. Six months following the intervention the scores were 18.06 (1.92), 18.27 (1.74) and 16.31 (2.58) respectively. Children's out of school safety behaviour was assessed by parental questionnaire. The response rate to the questionnaires was only 30%. It appears from the published reports that the cluster nature of the trial was not taken into account in the analyses.

- [Table 02/07] - Behaviour (reported) of 5 to 7 years old - post-test at 4 to 6 months

Always cross in crosswalks according to parents:
- Beltman program versus No training: RR 2.26 (1.20 to 4.24); RD 0.29 (0.08 to 0.49)
- (Beltman+Booster) versus No training: RR 1.18 (0.59 to 2.40); RD 0.04 (-0.13 to 0.21)

Always look before crossing according to parents:
- Beltman program versus No training: RR 1.40 (0.87 to 2.25); RD 0.15 (-0.06 to 0.37)
- (Beltman+Booster) versus No training: RR 1.74 (1.15 to 2.65); RD 0.29 (0.09 to 0.48)

- [Table 02/21] - Knowledge of 5 to 7 years old - post-test at less than 1 month

Post-test score of "Traffic safety knowledge" test (maximum score 20):
- Beltman program versus No training: SMD 0.97 (0.75 to 1.20) ; WMD 2.36 (1.86 to 2.86)
- (Beltman+Booster) versus No training: SMD 1.05 (0.83 to 1.27) ; WMD 2.59 (2.08 to 3.10)

- [Table 02/22] - Knowledge of 5 to 7 years old - post-test at 4 to 6 months

Post-test score of "Traffic safety knowledge" test (maximum score 20):
- Beltman program versus No training: SMD 0.76 (0.54 to 0.90); WMD 1.75 (1.27 to 2.23)
- (Beltman+Booster) versus No training: SMD 0.89 (0.67 to 1.11); WMD 1.96 (1.50 to 2.42)

- [Table 02/26] - Knowledge (change) of 5 to 7 years old - post-test at less than 1 month

Change in score of "Traffic safety knowledge" test (maximum score 20):
- Beltman program versus No training: SMD 1.00 (0.78 to 1.23); WMD 2.88 (2.28 to 3.48)
- (Beltman+Booster) versus No training: SMD 1.01 (0.80 to 1.23); WMD 2.93 (2.34 to 3.52)

- [Table 02/27] - Knowledge (change) of 5 to 7 years old - post-test at 4 to 6 months

Change in score of "Traffic safety knowledge" test (maximum score 20):
- Beltman program versus No training: SMD 0.80 (0.58 to 1.02); WMD 2.27 (1.68 to 2.86)
- (Beltman+Booster) versus No training: SMD 0.81 (0.60 to 1.02); WMD 2.30 (1.73 to 2.87)

Nishioka 1991 examined the effect of verbal instructions on the safety behaviour of children in a simulated traffic environment. The children were divided into three groups: one group received a caution advising how to behave safely, one was given a simple caution and one was given no caution. The children's behaviour was classified as safe if they both changed the speed of walking or running and looked to the right and left. The children's behaviour was classified as unsafe if there was no safety response, if they only changed speed or if they only looked. The percentages of children with safe behaviour in each group was 61% (detailed caution), 46% (simple caution) and 25% (no caution).

- [Table 01/03]

Safe behaviour - Detailed caution vs No caution: RR 2.43 (1.13 to 5.24); RD 0.36 (0.09 to 0.62)
Safe behaviour - Simple caution vs No caution: RR 1.83 (0.81 to 4.15); RD 0.21 (-0.06 to 0.47)

Renaud 1989 reported attitudes to pedestrian injury risk in children allocated to one of three traffic safety simulation games or to a control group.
The transfer of children's learning from the simulation game was measured by observing children's reaction to a quasi-real life model of traffic risks set up in the gymnasium. Once again the three intervention groups achieved higher mean scores on the transfer of learning test than the control group (attitude simulation game 8.7 (3.1); behaviour simulation game 10.4 (2.1); attitude and behaviour simulation game 10.1 (2.3); control 7.9 (3.7)).

- [Table 01/04]

Post-test Transfer Score (maximum score 31) - Attitude game versus No training: SMD 0.23 (-0.26 to 0.73); WMD 0.80 (-0.89 to 2.49)
Post-test Transfer Score (maximum score 31) - Behaviour game versus No training: SMD 0.83 (0.31 to 1.35); WMD 2.50 (0.99 to 4.01)
Post-test Transfer Score (maximum score 31) - Attitude&Behaviour game versus No training: SMD 0.71 (0.20 to 1.22); WMD 2.20 (0.66 to 3.74)
Children's intended behaviour was assessed by showing children a picture of a road, asking a series of questions and the children would use stickers to answer the questions. The means of the behaviour tests were slightly higher for each of the intervention groups than the control group (attitude simulation game 4.9 (0.2); behaviour simulation game 4.3 (0.8); attitude and behaviour simulation game 4.5 (0.7); control 4.0 (1.1)).

- [Table 01/10]

Post-test Behaviour Score (maximum score 5) - Attitude game versus No training: SMD 1.13 (0.62 to 1.64) ; WMD 0.90 (0.52 to 1.28)
Post-test Behaviour Score (maximum score 5) - Behaviour game versus No training: SMD 0.31 (-0.17 to 0.79) ; WMD 0.30 (-0.16 to 0.76)
Post-test Behaviour Score (maximum score 5) - Attitude&Behaviour game versus No training: SMD 0.54 (0.05 to 1.02) ; WMD 0.50 (0.06 to 0.94)
The means (SD) of the attitude tests were similar for each of the intervention groups but different from the control group (attitude simulation game 1.9 (0.7); behaviour simulation game 1.8 (0.6); attitude and behaviour simulation game 2.0 (0.7); control 1.3 (0.7)).

- [Table 01/10]

Post-test Attitude Score (maximum score 3) - Attitude game versus No training: SMD 0.85 (0.35 to 1.35); WMD 0.60 (0.27 to 0.93)
Post-test Attitude Score (maximum score 3) - Behaviour game versus No training: SMD 0.76 (0.26 to 1.26); WMD 0.50 (0.19 to 0.81)
Post-test Attitude Score (maximum score 3) - Attitude&Behaviour game versus No training: SMD 0.99 (0.48 to 1.50); WMD 0.70 (0.36 to 1.04)
Singh 1979 examined the effect of the use of traffic education materials by class teachers. The outcome measure was change in knowledge assessed by a test specially developed for each book and the proportion of children achieving 'Mastery' (at least 80% correct answers on the post-test). The mean test scores in the class using book one (infants) was 28 (6) before and 34 (10) after the intervention compared with 28 (7) and 30 (6) in the control group. In the class using book two (lower juniors) the mean score was 32 (12) before and 45 (11) after the intervention, compared with 32 (11) and 33 (11) in the control group. In the class using book three (upper junior and middle) the mean score was 28 (7) before and 35 (7) after the intervention, compared with 29 (8) and 31 (8) in the control group. In the group using book one, the proportion of children achieving mastery was 27% in the intervention group compared with 9% in the control group. In the group using book two the corresponding figures were 42% and 13%, and in the group using book three 39% of the intervention group achieved mastery compared with 17% in the control group.

- [Table 02/21] - Knowledge of 5 to 7 years old - post-test at less than 1 month

Post-test score of "Cognitive" test (maximum score 54): SMD 0.41 (0.30 to 0.52); WMD 3.65 (2.74 to 4.56)

- [Table 02/23] - Knowledge of 7 to 9 years old - post-test at 4 to 6 months

Post-test score of "Cognitive" test (maximum score 64): SMD 1.03 (0.91 to 1.15); WMD 11.30 (10.08 to 12.52)

- [Table 02/25] - Knowledge of 10 to 13 years old - post-test at 4 to 6 months

Post-test score of "Cognitive" test (maximum score 64): SMD 0.49 (0.38 to 0.60); WMD 3.71 (2.87 to 4.55)

- [Table 02/27] - Knowledge (change) of 5 to 7 years old - post-test at 4 to 6 months

Change in score of "Cognitive" test (maximum score 54): SMD 0.47 (0.36 to 0.57); WMD 3.83 (2.98 to 4.68)

- [Table 02/28] - Knowledge (change) of 7 to 9 years old - post-test at 4 to 6 months

Change in score of "Cognitive" test (maximum score 64): SMD 0.96 (0.85 to 1.08); WMD 10.92 (9.67 to 12.17)

- [Table 02/29] - Knowledge (change) of 10 to 13 years old - post-test at 4 to 6 months

Change in score of "Cognitive" test (maximum score 64): SMD 0.57 (0.46 to 0.68); WMD 4.28 (3.46 to 5.10)
Thomson 1992 reported the mean proportion of routes falling into different safety categories as a function of training group and testing phase. For children trained in a real traffic environment, the proportion of routes (standard deviations in brackets) classified as safe was: PT=0.10 (0.14), PT1=0.35 (0.21), PT2=0.34 (0.18). For children trained with the tabletop model, the proportion of routes classified as safe was: PT=0.14 (0.12), PT1=0.37 (0.21), PT2=0.37 (0.16). For untrained children, the proportion of routes classified as safe was: PT=0.04 (0.05), PT1=0.12 (0.25), PT2= 0.12 (0.24).

- [Table 01/10] - Post-test 1:

Post-test proportion of routes categorised as Safe - Roadside training versus No training: SMD 0.95 (0.02 to 1.89); WMD 0.23 (0.03 to 0.43)
Post-test proportion of routes categorised as Safe - Table top training versus No training: SMD 1.40 (0.09 to 1.98); WMD 0.25 (0.05 to 0.45)

- [Table 01/14] - Post-test 1:

Change in proportion of routes categorised as Safe - Roadside training versus No training: SMD 0.77 (-0.14 to 1.69); WMD 0.17 (-0.01 to 0.35)
Change in proportion of routes categorised as Safe - Table top training versus No training: SMD 0.70 (-0.21 to 1.60); WMD 0.15 (-0.03 to 0.33)

- [Table 01/11] - Post-test 2:

Post-test proportion of routes categorised as Safe - Roadside training versus No training: SMD 0.99 (0.05 to 1.93); WMD 0.22 (0.03 to 0.41)
Post-test proportion of routes categorised as Safe - Table top training versus No training: SMD 1.17 (0.21 to 2.14); WMD 0.25 (0.07 to 0.43)

- [Table 01/15] - Post-test 2:

Change in proportion of routes categorised as Safe - Roadside training versus No training: SMD 0.80 (-0.12 to 1.72); WMD 0.16 (-0.01 to 0.33)
Change in proportion of routes categorised as Safe - Table top training versus No training: SMD 0.78 (-0.14 to 1.70); WMD 0.15 (-0.01 to 0.31)
Thomson 1997a reported the mean proportion of routes falling into different safety categories as a function of training group and testing phase. For the trained children, the proportion of routes (standard deviations) classified as safe was: PT=0.07 (0.11), PT1= 0.26 (0.23), PT2=0.21 (0.18). For the children who were not trained (the control group), the proportion of routes classified as safe was: PT=0.08 (0.11), PT1=0.15 (0.20), PT2=0.19 (0.21). Children's behaviour was reported when crossing between parked cars for part two, and when crossing near a junction for part three. Thomson 1997b reports similar outcomes for another group of children.

- [Table 01/03] - Behaviour (observed) of 5 to 7 years old - post-test at less than 1 month

21 Stop at kerb - Parked cars - no distraction:
Thomson 1997a: RR 1.43 (1.13 to 1.81); RD 0.29 (0.13 to 0.45)
Thomson 1997b: RR 1.13 (0.99 to 1.29); RD 0.11 (0.00 to 0.23)
22 Stop at kerb - Junctions - no distraction
Thomson 1997b: RR 1.13 (0.98 to 1.30); RD 0.11 (-0.01 to 0.23)
23 Stop at line of vision - Parked cars - no distraction
Thomson 1997a: RR 1.66 (1.23 to 2.25); RD 0.37 (0.19 to 0.54)
Thomson 1997b: RR 2.56 (1.68 to 3.90); RD 0.57 (0.41 to 0.74)
24 Look three times at line of vision - Parked cars - no distraction
Thomson 1997a: RR 1.70 (1.21 to 2.39); RD 0.35 (0.16 to 0.53)
Thomson 1997b: RR 2.65 (1.69 to 4.15); RD 0.56 (0.39 to 0.73)
25 Choose a position that offers a clear view - Junctions - no distraction
Thomson 1997b: RR 1.20 (0.87 to 1.66); RD 0.12 (-0.08 to 0.33)

- [Table 01/05] - Behaviour (observed) of 5 to 7 years old - post-test at 1 to 3 months

21 Stop at kerb - Parked cars - no distraction
Thomson 1997a: RR 1.30 (1.05 to 1.61); RD 0.22 (0.06 to 0.37)
Thomson 1997b: RR 1.03 (0.97 to 1.08); RD 0.03 (-0.04 to 0.09)
22 Stop at kerb - Junctions - no distraction
Thomson 1997b: RR 0.98 (0.95 to 1.02); RD -0.02 (-0.08 to 0.04)
23 Stop at line of vision - Parked cars - no distraction
Thomson 1997a: RR 1.72 (1.28 to 2.31); RD 0.40 (0.23 to 0.57)
Thomson 1997b: RR 1.72 (1.26 to 2.36); RD 0.38 (0.20 to 0.56)
24 Look three times at line of vision - Parked cars - no distraction
Thomson 1997a: RR 1.94 (1.33 to 2.83); RD 0.42 (0.24 to 0.60)
Thomson 1997b: RR 2.02 (1.37 to 2.98); RD 0.43 (0.24 to 0.61)
25 Choose a position that offers a clear view - Junctions - no distraction
Thomson 1997b: RR 1.17 (0.87 to 1.58); RD 0.11 (-0.09 to 0.31)

- [Table 02/10] - Attitude of 5 to 7 years old - post-test at less than 1 month

Thomson 1997a: Post-test proportion of routes categorised as Safe: SMD 0.51 (0.12 to 0.90); WMD 0.11 (0.03 to 0.19)

- [Table 02/11] - Attitude of 5 to 7 years old - post-test at 1 to 3 months

Thomson 1997a: Post-test proportion of routes categorised as Safe: SMD 0.10 (-0.28 to 0.48); WMD 0.02 (-0.05 to 0.09)

- [Table 02/14] - Attitude (change) of 5 to 7 years old - post-test at less than 1 month

Thomson 1997a: Change in proportion of routes categorised as Safe: SMD 0.65 (0.26 to 1.04); WMD 0.12 (0.05 to 0.19)
Thomson 1997a: Change in proportion of routes categorised as Safe or More safe: SMD 0.51 (0.12 to 0.90); WMD 0.11 (0.03 to 0.19)

- [Table 02/15] - Attitude (change) of 5 to 7 years old - post-test at 1 to 3 months

Thomson 1997a: Change in proportion of routes categorised as Safe: SMD 0.17 (-0.21 to 0.55); WMD 0.03 (-0.03 to 0.09)
Thomson 1997a: Change in proportion of routes categorised as Safe or More safe: SMD 0.10 (-0.28 to 0.48); WMD 0.02 (-0.05 to 0.09)
Thomson 1998 reported the mean proportion of routes falling into different safety categories as a function of training group and testing phase. For the trained children, the proportion of routes (standard deviation) classified as safe was: PT=0.15 (0.14), PT1= 0.43 (0.31), PT2=0.35 (0.29). For the children who were not trained (the control group), the proportion of routes classified as safe was: PT=0.16 (0.12), PT1=0.13 (0.09), PT2=0.16 (0.19).

- [Table 01/10] - Post-test 1:

Post-test proportion of routes categorised as Safe - (Table top & roadside training) versus No training: SMD 1.30 (0.74 to 1.86); WMD 0.30 (0.18 to 0.42)

- [Table 01/14] - Post-test 1:

Change in proportion of routes categorised as Safe - (Table top & roadside training) versus No training: SMD 1.48 (0.91 to 2.06); WMD 0.31 (0.21 to 0.41)

- [Table 01/11] - Post-test 2:

Post-test proportion of routes categorised as Safe - (Table top & roadside training) versus No training: SMD 0.76 (0.24 to 1.29); WMD 0.19 (0.07 to 0.31)

- [Table 01/15] - Post-test 2:

Change in proportion of routes categorised as Safe - (Table top & roadside training) versus No training: SMD 0.92 (0.39 to 1.46); WMD 0.20 (0.09 to 0.31)

DISCUSSION

After screening close to 14,000 published and unpublished studies, we identified 15 randomised-controlled trials of pedestrian safety education programmes. The methodological quality of the included trials was generally poor. The method of allocation concealment was adequate in three trials, outcome assessment was blinded in eight, and in most of the included studies large numbers of participants were lost to follow-up. None of the trials was conducted in a developing country setting and there were no trials of pedestrian safety training in the elderly. The studies identified were conducted between 1976 and 1997. Because of differences in the types of interventions and in the outcome measures used in the 15 included trials, meta-analyses were not carried out.

None of the included trials assessed the effect of pedestrian safety education on the occurrence of pedestrian injury but six trials assessed the effect on observed behaviour. Some of these trials showed evidence of behavioural change following pedestrian safety education but for a variety of reasons it is difficult to predict what effect this might have on pedestrian injury risk. Firstly, we cannot be sure that the observed behaviour is causally related to the occurrence of pedestrian injury. For example, Nishioka 1991 examined the effect of verbal instructions on the safety behaviour of children in a simulated traffic environment. The children were shown a video of a running motorcycle in an environment in which they were playing catch. The children's behaviour was classified as safe if they changed their speed of walking or running and looked right and left. In this particular study, slowing down or stopping were considered to be the safe response. Even if the behavioural changes observed in the simulated traffic environment were also present in a real traffic situation, it is difficult to estimate what effect, if any, these behaviours would have on injury risk. For example, once a child has established that the road is clear, it may be safer to run across the street before another vehicle passes because it reduces the time of exposure to risk. Similarly, in the study by Ampofo-Boateng 1993, routes chosen by the children were coded into four safety categories, depending on the degree to which dangerous road features were avoided in the chosen route. However, the authors provide no evidence that making the 'correct' choices would lead to a reduction in injury risk. Indeed, in the example given by the authors, the routes classified as 'more safe' and 'safe' involved two crossings, whereas the routes classified as very unsafe and unsafe involved one road crossing. Whether two 'safe' road crossings would involve a lower risk of pedestrian injury than one 'unsafe' road crossing is questionable.

Secondly, assuming that the behaviours measured are causally related to pedestrian injury risk, we have no reliable information about the magnitude of this effect and so we cannot predict how much a given behavioural change will reduce a child's pedestrian injury risk. Finally, there is uncertainty about the extent to which the observed behavioural changes persist over time. For example, in the study by Ampofo-Boateng 1993, for children trained in a real traffic environment the proportion of routes classified as safe declined from 72% immediately after training to 50% nine weeks later.

There are some methodological issues that could have an important bearing on the validity of the results of this systematic review. In particular, publication and other selection biases may have resulted in the over representation of studies showing promising intervention effects. This is particularly likely in the context of road safety where a large proportion of the available research information is published in the grey literature of the road safety research organisations. Most of the statistical methods that can be used to assess the possibility of publication bias require the use of meta-analysis and so cannot be used in this systematic review. Although considerable efforts were made to identify all eligible trials, published and unpublished, irrespective of language of publication, we cannot exclude the possibility of selection bias. The validity of the inferences from any systematic review depends on the quality of the included studies and in this case many of the studies were of poor quality. It is has been shown that inadequate allocation concealment, lack of blinding of outcome assessment and large losses to follow-up can result in the overestimation of intervention effects in randomised-controlled trials, and many of these methodological weaknesses were present in the included trials (Schulz 1995).

Each year some 300,000 children die in road traffic crashes worldwide. Most of these deaths are in countries that the World Bank classes as low and middle-income countries and most involve children as pedestrians. The provision of pedestrian safety education for children in these countries is considered to be an essential part of a global road safety strategy and has been strongly recommended by the Global Road Safety Partnership (GRSP) who say "One reason why these accidents happen is that children do not have the necessary knowledge and skills that allow them to deal with

the hostile traffic environment. Receiving road safety education as part of their normal school curriculum is recognised as being one of the most effective ways of providing children with this type of knowledge".

Given the lack of high-quality randomised-controlled trials of pedestrian safety education, in particular the lack of trials in low and middle-income countries, and the fact that none of the available trials have assessed injury outcomes, GRSP optimism about the potential of this intervention may be misplaced. Whilst the value of pedestrian safety education remains in doubt, environmental modification and the enforcement of appropriate speed limits may be a more effective strategy to protect children from the hostile traffic environment.

is evidence that changes in safety knowledge and observed behaviour decline with time, suggesting that safety education must be repeated at regular intervals.

Implications for research

Large-scale randomised controlled trials with injury outcomes (or endpoints that are likely to predict injury outcomes such as near-miss collisions) are needed to establish the effectiveness of pedestrian safety education. Although a number of existing trials show evidence of behavioural change following pedestrian safety education, the target behaviours in these trials cannot be assumed to decrease pedestrian injury risk.

AUTHORS' CONCLUSIONS

Implications for practice

Pedestrian safety education can result in improvement in children's knowledge of the road crossing task and can change observed road crossing behaviour but whether this reduces the risk of pedestrian motor vehicle collision and injury occurrence is unknown. There

ACKNOWLEDGEMENTS

Thanks to Reinhard Wentz and Irene Kwan for help with database searching and obtaining papers, to Angela Huertas, Maaike Kruseman, Valdo Pezzoli and Finn Johnsen for help with translation, to Marjan Loep from the Dutch Cochrane Centre for help with the Dutch titles and to Toshihiko Yanagawa for help with translation and contacting Japanese experts.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Ampofo-Boateng 1993

Methods	Allocation by alternation from class register in alphabetical order with separate lists for boys and girls. Outcome assessment blinded. Loss to follow-up was 37.5% for the intervention groups.
Participants	26 children aged 5 yrs old who were randomly selected from a primary school in Edinburgh, Scotland
Interventions	Children were divided into three groups: 1. trained using a tabletop model of the traffic environment; 2. trained in a real traffic environment; 3. no training. The training concentrated on two main areas: failing to recognise dangerous road crossing sites and selecting the most direct route to the destination as safest. Each group underwent six training sessions at a rate of about one per week. The training aimed to help children appreciate the danger posed by poor visibility, complex road layouts and lengthy excursions across the road. The broad aim of the training was to improve children's understanding so that they could deal flexibly with a wide range of traffic situations
Outcomes	The outcome measure was children's perceptions about the safest place to cross the road. Children were taken to the roadside on 3 occasions, asked to imagine that they were alone and to indicate their preferred route to cross to get to a specific destination marked by a red cone. Their answers were reported on a diagram and coded into 4 safety categories (very unsafe, unsafe, more safe, safe). Results were presented as the mean proportion of routes falling into each safety category as a function of training. Children were never asked to cross the road. Intervention groups had pre-test and post-tests observations: immediately after 6th training session (post-test 1), 63 days after end of training (post-test 2) and 8 months (post-test 3). Control group had only post-test 3
Notes	Study done 1989

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Bouck 1992

Methods	Allocation by selecting paper cards drawn from basket by "blind" person. Outcome assessment was blind to intervention allocation. Loss to follow-up was 20% for both groups
Participants	40 children 8 to 11 years old who were randomly selected from two small primary schools of Wiltshire County, Western England
Interventions	Children were divided in 2 groups: 1. trained in classroom and in semi-real environment; 2. no training. The aim of the programme was to improve children knowledge and behaviour by providing a road safety education package with support materials to be used by class teachers during 6 units. Teaching strategies included topic webs, lectures, class discussions and and group activities
Outcomes	The outcome measure was a post-test on knowledge conducted immediately after the intervention. Only two units were evaluated: (a) conspicuity and (b) mass, speed and control. In each school the experimental group was given the road safety support materials and administered the post-test. The control group was also administered the post-test
Notes	Study done 1992

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Cross 1988

Methods	Cluster allocation (classrooms) to control or intervention group by drawing lots from a hat, after children had been individually allocated to their class by drawing lots from a hat. No information given on blinidng of outcome assessment or loss to follow-up
Participants	138 children 7 to 8 yrs old who were randomly selected from 3 primary schools in Melbourne, Australia
Interventions	Children were divided in 2 groups: 1. trained in the classroom during a unit on speed; 2. no training. The training aimed at improving children's understanding of the concept of speed in the hope that this would enable them to make safer road crossing decisions. The course incorporated elements of an integrated educational experience
Outcomes	Outcome measures were observations of children's response and documentation of verbal explanation. In a play situation children were asked to perform 4 tasks before (pre-test) and after intervention (post-test)

Cross 1988 (*Continued*)

	Task 1: speed and time variables are fixed; children operate on distance variable (complex case of unequal speeds). Task 2: speed and time variables are fixed; children operate on distance variable (simple case of equal speeds). Task 3: speed and distance variables are fixed; children operate on time variable (complex case of unequal speeds). Task 4: speed and distance variables are fixed; children operate on time variable (simple case of equal speeds)
Notes	Year of study not provided.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Downing 1981

Methods	Allocation by computer. Assessors were not blinded to intervention status and loss to follow-up was 44% mostly because children had moved out of the area
Participants	1560 children aged 3 yrs old and their parents, selected from 2 towns and 1 rural district in England
Interventions	Children were divided in 4 groups: 1. road safety booklet after an interview; 2. interview but no booklet. 3. road safety booklet with a letter. 4. No intervention. The aim of the study was to assess the effectiveness of the booklet in improving parental road safety education and road supervision
Outcomes	Children were tested with pictures from the booklet on simple traffic knowledge and simple safety rules. Only the first 2 groups had an interview before the intervention (pre-test), but all groups had one at the end of the intervention (post-test at 2 months)
Notes	Study done 1979.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	Low risk	Adequate

Limbourg 1981

Methods	Cluster allocation (schools) by block randomisation within groups of four similar schools (matched for age, sex, parental social status and urban characteristics of living area) by selecting paper cards drawn from envelope by "blind" person. Outcome assessment was blind to intervention group. Overall loss to follow-up was 15%
Participants	658 parents volunteered to learn how to teach safe pedestrian behaviour to their 3-6 yr old children from 26 kindergarten schools in Augsburg, Germany
Interventions	Children were divided into 4 groups: 1. behavioural road safety training by parent with psychologist's supervision; 2. behavioural road safety training by parent without psychologists supervision;. 3. parents were shown a film and given a booklet on road safety problems in childhood 4. No training. The main goal of the research project was to improve road safety behaviour of pre-school children on the basis of behavioural learning theories and empirical research findings. The behavioural training programme consisted of a film and an instructional booklet that set behavioural learning objectives and demonstrated how to reach them. The film showed model parents carrying out the behavioural modification programme with children in different traffic situations. The booklet included pictures from the film with training instructions
Outcomes	Outcome measures were observation of children's behaviour in situations with and without distraction (objects to pick up on the other side of the road) in real traffic situation (2 way traffic with 2 kerbs). Pre-test: alone; bring back a ball as quickly as possible (with distraction); bring photos back without timing (without distraction). Post-test 1: +1 month; in pairs, competition to bring back red objects (with distraction); bring photos back without competition (without distraction). Post-test 2: +5 months; combination of pre-test and post-test 1 but with toys to bring back instead of red objects (with distraction); bring a bag back without competition (without distraction)
Notes	Study done 1978 25 parents from INT1 refused to be supervised by psychologists and were considered as being in INT2: not intention-to-treat analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	High risk	Inadequate

Luria 2000

Methods	Cluster allocation (schools) by drawing identical pieces of paper with the name of schools. Assessors were not blinded to intervention allocation. Loss to follow-up was 26% for both groups
Participants	246 children who were randomly selected from kindergarten and primary classes of elementary schools in Columbus, Ohio, USA

Luria 2000 (*Continued*)

Interventions	Children were divided into two groups: 1. trained with the Safety City programme; 2. no training. Safety City is a safety education programme which focuses on three safety issues: how to cross the street, call 911 in an emergency situation, and avoid strangers. For the road crossing section, trained volunteers used a mock intersection of the traffic environment and a lecture in classroom in a 20 minutes session. Children also received a booklet and attended a rock concert reinforcing the messages The training concentrated on 7 main messages: (a) Cross the street at the corner, (b) Look both ways, (c) Listen for cars, trucks, and motorcycles, (d) Never run in the street, (e) Cross the street with an adult if possible, (f) Always tell the person responsible for you where you are going, (g) Traffic lights (red means stop; green means go; yellow means slow down)
Outcomes	Evaluation tool specially developed to assess change in individual knowledge by test scores. The questions were checked by a paediatric psychologist. Children were tested with a drawing of a city map and in a mock intersection. They showed how they would cross. They were also asked about the colours on a traffic light. Children were never asked to cross the road. The maximum number of points for the section on crossing the street was 16. Individual questions were weighted with regard to their importance to the Safety City curriculum. Both groups were tested before and 6 months after the intervention or after the pre-test (control group). Results were presented as the mean scores
Notes	Study done 1996-1997.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Matson 1980

Methods	Allocation by block randomisation within triplets of individuals. Outcome assessment blinded. Information on loss to follow-up not provided.
Participants	30 "mentally retarded" institutionalised adults aged 21 to 55 years from Pittsburg, USA
Interventions	Participants were divided in three groups: 1. individual training in classroom using a tabletop model (each participant received 30 minutes of behavioural training). 2. independence training in a semi-real traffic situation (participants were taught how to recognise common pedestrian signs and target pedestrian behaviours). 3. training in how to cook and to make the bed.

Matson 1980 (*Continued*)

Outcomes	Outcome measures were steps performed correctly on a set of target behaviours (proper sidewalk behaviour, recognition of an intersection, crossing the street) at a city intersection. They were assessed before and after the intervention
Notes	Year of study not provided. Data extracted from graph.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Miller 1982

Methods	Cluster allocation (classrooms) using a list of random numbers read by someone not entering participants into trial. Assessor blinding not stated. Loss to follow-up was 6% for knowledge test, 65% and 77% for reported behaviour
Participants	Study participants were 550 second grade children in Oregon, USA
Interventions	Children were divided into three groups: 1. Beltman programme; 2. Beltman programme with a booster course at 4 months; 3. normal safety teaching. The Beltman programme was a multi-media traffic safety programme, the main objective of which was to develop the habit of seat-belt wearing but the programme materials also focused on correct pedestrian behaviour. Teachers trained the children.
Outcomes	The two outcome measures were child's safety knowledge and behaviour. Knowledge was assessed with a 20-item multiple-choice test performed before (pre-test), immediately after (post-test 1) and after 6 months (post-test 2). Parents reported their child's safety behaviour with a postcard sized questionnaire mailed when post-tests took place
Notes	Study done September 1981 to April 1982.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Nishioka 1991

Methods	Allocation by block randomisation within triplets of individuals (matched for age, sex and class) using table of random numbers. Outcome assessment was not blinded. Lost to follow-up 10%
Participants	79 children between 4 and 5 yrs old attending a kindergarten in Tokyo, Japan
Interventions	Children were divided into three groups: 1. caution advising how to behave safely ("a motorcycle is running; if you come around here, stop surely and look at the right and left side, as it is dangerous"); 2. simple caution ("A motorcycle is running. Be careful as it is dangerous").; 3. No caution.
Outcomes	The children's behaviour was observed and recorded on video. The children's behaviour was classified as safe if they both changed the speed of walking or running and looked to the right and left. The children's behaviour was classified as unsafe if there was no safety response, if they only changed speed or if they only looked. Outcome was measured after the intervention (post-test only)
Notes	Study done June 1983 Paper also reports an experiment with similar setting testing audio-visual information as factors on children behaviour

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	Low risk	Adequate

Renaud 1989

Methods	Allocation by alternation. Outcome assessment not blinded. No loss to follow up.
Participants	136, five-year-old children from four schools in Montreal, Canada
Interventions	Children were divided into four groups: 1. simulation game (1) targeted attitude: the game aims to change attitudes through role play and group dynamics; 2. simulation game (2) targeted behaviour: the game aims to change behaviour through modelling and training elements. 3. simulation game (3) targeted attitude and behaviour: the game aims to change both attitudes and behaviour with role play, group dynamics, modelling and training; 4. control group (no simulation game).
Outcomes	The three outcomes measured after the intervention were: (1) Attitude score (range 0-3 / Day 1): children looked at 10 photos and told their perception of risk (health dimension) and how to avoid risk (perception dimension). (2) Behaviour score (range 0-5 / Day 1) : children answered questions by showing how they would behave on a picture of a road

Renaud 1989 (*Continued*)

	with the help of stickers. (3) Transfer of learning score (range 0-31 / Day 10): a trained observer scored selected behaviours of children in a quasi-real traffic environment set up in a gymnasium
Notes	Study done 1987. Reliability coefficients: Attitude Score alpha=0.89, Behaviour Score alpha=0.41, Transfer of learning score alpha=0.85.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	High risk	Inadequate

Singh 1979

Methods	Cluster allocation (classrooms) but method not stated. Assessor blinding was not stated. Number of classes lost to follow-up: 2 refused and 7 did not complete in intervention group (7/106=6.6%), 33 refused and none did not complete in control group
Participants	Children aged between 5 and 13 yrs old selected from schools within six education authorities in the UK
Interventions	Children were divided into two groups: 1. intervention group: the study intervention involved the use of traffic education materials by class teachers; the materials were books designed to help children improve their knowledge and awareness of the real world of traffic, one book for infant and two for junior and middle schools. 2. control group: The control group received no road safety education
Outcomes	Outcome measures were change in knowledge assessed by a test specially developed for each book, and proportion of children achieving "Mastery" (at least 80% correct answers on the post-test). Children were tested before training (PT), six months after training (PT1)
Notes	Study done 1976.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Thomson 1992

Methods	Allocation by alternation from class register in alphabetic order with separate lists for boys and girls. Outcome assessment blinded. No loss to follow up
Participants	30 children aged 5 years who were randomly selected from a primary school in Edinburgh, Scotland
Interventions	Children were divided into three groups: 1. trained in a real traffic environment; 2. trained using a tabletop model of the traffic environment. 3. No training. The intervention was almost identical to the study by Ampofo-Boateng 1993 but the children were trained in small groups rather than individually
Outcomes	The outcome measure was the mean proportion of routes classified as safe as a function of the training. Children indicated their preferred route by pointing and describing it to the investigator. They were not asked to walk across the road. All tests were conducted in the road environment. Children were tested before training (PT), immediately after training (PT1), and two months after training (PT2)
Notes	Study done 1990.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Thomson 1997a

Methods	Allocation by alternation from class register in alphabetical order with separate lists for boys and girls. Outcome assessment was blind to intervention group
Participants	104 children aged 5 years randomly selected from 10 primary schools in Glasgow, Scotland
Interventions	Children were divided into two groups: 1. trained in a real traffic environment; 2. no training. The training concentrated on two main areas: recognising dangerous road crossing sites and selecting the most direct route to the destination as safest. Part 1 focused on the identification of safe places to cross, Part 2 on crossing safely between parked cars and Part 3 on crossing safely near junctions. Each group underwent six training sessions for Part 1 and Part 3, four training sessions for Part 2, at a rate of about one per week
Outcomes	For Part 1, the outcome measure was children's perceptions about the safest place to cross the road. Children were taken to the roadside, asked to imagine that they were alone and to indicate their preferred route to cross to get to a specific destination marked by a red cone. Their answers were reported on a diagram and coded into 4 safety categories (very unsafe,

Thomson 1997a (*Continued*)

	unsafe, more safe, safe). Results were presented as the mean proportion of routes falling into each safety category as a function of training. Children were never asked to cross the road. Both groups had pre-test and post-test observations immediately after 6th training session (post-test 1) nad two to three months after end of training (post-test 2) For Part 2, the outcome measure was children's behaviour when crossing between parked cars. For Part 3, the outcome measure was children's behaviour when crossing near a junction
Notes	Study done 1995.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Thomson 1997b

Methods	Same as Thomson 1997a but with a second "cohort" of children conducted the year after
Participants	97 children aged 5 yrs old randomly selected from 10 primary schools in Glasgow, Scotland
Interventions	Same as Thompson 1997a.
Outcomes	Same as Thompson 1997a.
Notes	Study done 1996.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Thomson 1998

Methods	Allocation by alternation from class register in alphabetical order with separate lists for boys and girls. Outcome assessment blinded. No loss to follow up
Participants	60 children aged 5 years whose parents agreed to participate, from three primary schools in Glasgow, Scotland
Interventions	Children were divided into 2 groups: 1. trained using a tabletop model of the traffic environment as well as in the real traffic environment; 2. no training. The training concentrated on the same areas as in Ampofo-Boateng 1993, but was provided

	by ten parent volunteers who received experience of training children at courses organised within the school. Volunteers were recruited from among the parents at the participating schools to assist in training other people's children. Before training the children, all volunteers took part in a one-day training course to ensure that they understood the aims and objectives of the programme. Children in the trained group received two sessions of training at the roadside followed by four sessions on a table-top model, each session lasted about 30 minutes and were conducted over a three week period
Outcomes	The outcome measure was the mean proportion of routes classified as safe as a function of the training. All tests were conducted in the road environment. Children indicated their preferred route by pointing and describing it to the investigator. They were not asked to walk across the road. Children were tested before training (PT), immediately after training (PT1), and 40 days after training (PT2)
Notes	Study done 1991.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	High risk	Inadequate

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Antaki 1986	Controlled before/after, allocation not randomised.
Blomberg 1975	Control group, no evidence of random allocation could be obtained
Blomberg 1983	Controlled before/after, allocation not randomised.
Bostick 1975	Control group, no evidence of random allocation could be obtained
Boyle 1973	Controlled before/after, allocation not randomised.
Bryan-Brown 1995	Controlled before/after, allocation not randomised.
Bryan-Brown 1999	Controlled before/after, allocation not randomised.
Clayton 1991	Controlled before/after, allocation not randomised.
Cleven 1994	Controlled before/after, allocation not randomised.
Colborne 1971B	Comparing 2 ways of education but without control group.

(*Continued*)

Cross 1991	Controlled before/after, no evidence of random allocation could be obtained
Cross D 2000	Controlled before/after, allocation randomised but only 3 clusters for 2 interventions + 1 control
Davidson 1994	Controlled before/after, allocation not randomised.
Demetre 1993	Controlled before/after, allocation not randomised (post-hoc selection of control group)
Downing 1981D	Controlled before/after, allocation not randomised.
Dueker 1975	RCT comparing 3 pedestrian safety education methods without control group
Dueker 1981	Controlled before/after, allocation not randomised.
Firth 1973	Controlled before/after, allocation not randomised.
Fisk 1975	Controlled before/after, no evidence of random allocation could be obtained
Geiler 1981	Controlled before/after, allocation not randomised.
Gregersen 1994	Controlled before/after, allocation not randomised.
Grime 1952	Controlled before/after, allocation not randomised.
Guyer 1989	Controlled before/after, allocation not randomised.
Hazinski 1995	Cohort study design.
Heinrich 1976	Controlled before/after, allocation not randomised.
Jones 1979	Controlled before/after, no evidence of random allocation could be obtained
Kelly 1987	Randomised controlled trial but no pedestrian education.
Kromann 1976	Controlled before/after, no evidence of random allocation could be obtained
Lahtinen 1973	Controlled before/after, allocation not randomised.
Linklater 1978	Uncontrolled before/after.
Maisey 1982	Controlled before/after, allocation not randomised.
McKelvey 1978	RCT comparing 2 ways of education (feedback vs non-feedback) but without control group
Padgett 1975	Controlled before/after, no evidence of random allocation could be obtained
Pease 1967	Controlled before/after, allocation not randomised.

(*Continued*)

Peterson 1988	Controlled before/after, allocation not randomised.
Powney 1995	Comparing 3 ways of education but without control group.
Preusser 1988	Control group, no evidence of random allocation could be obtained
Rothengatter 1981	Controlled before/after, no evidence of random allocation could be obtained
Sandels 1975	Report controlled trials conducted in the sixties - no evidence of randomisation could be obtained
Sayer 1997	The 12 schools taking part in the study were "split into two matched groups of six schools each." No details were provided about how schools were allocated. The authors were contacted for further information and on the basis of their responses it could not be confirmed that random allocation was used to form the intervention and comparison groups
Schelp 1988	Controlled before/after, allocation not randomised.
Schioldborg 1976	Controlled study, allocation not randomised. Provides accident data
Stikarova 1991	Controlled before/after, allocation not randomised.
Stuy 1993	RCT but no pedestrian education component (child passenger safety - use of seatbelts)
Tucker 1993	Controlled before/after, allocation not randomised.
Van den Herik 1981	Uncontrolled before/after.
Van Schagen 1988	Controlled before/after, no evidence of random allocation could be obtained
Van Steenwijk 1984	Uncontrolled before/after.
Wiener 1968	Controlled before/after, allocation not randomised.
Young 1987	Comparing 2 ways of education but without control group.
Ytterstad 1995	Controlled before/after, no allocation. Comparison with another Norwegian city (non-equivalent control and no-equivalent variable design). Provides data on injury rates
Zeedyk 2001	RCT comparing 3 pedestrian safety education methods without a valid control group

DATA AND ANALYSES

Comparison 1. Direct education compared to No education

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month	1		Risk Ratio (M-H, Random, 95% CI)	Totals not selected
1.1 Safe behaviour - Detailed caution vs No caution	1		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.2 Safe behaviour - Simple caution vs No caution	1		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month	1		Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
2.1 Post-test Transfer Score (maximum score 31) - Attitude game versus No training	1		Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
2.2 Post-test Transfer Score (maximum score 31) - Behaviour game versus No training	1		Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
2.3 Post-test Transfer Score (maximum score 31) - Attitude&Behaviour game versus No training	1		Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
3 Behaviour (observed) of institutionalised adults - post-test at less than 1 month	1		Risk Ratio (M-H, Random, 95% CI)	Totals not selected
3.1 Post-test mean proportion of steps correct - classroom versus control	1		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
3.2 Post-test mean proportion of steps correct - “independence” versus control	1		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4 Attitude of 5 to 7 yr olds - post-test at less than 1 month	3		Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
4.1 Post-test Behaviour Score (maximum score 5) - Attitude game versus No training	1		Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
4.2 Post-test Behaviour Score (maximum score 5) - Behaviour game versus No training	1		Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
4.3 Post-test Behaviour Score (maximum score 5) - Attitude&Behaviour game versus No training	1		Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]

4.4 Post-test Attitude Score (maximum score 3) - Attitude game versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
4.5 Post-test Attitude Score (maximum score 3) - Behaviour game versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
4.6 Post-test Attitude Score (maximum score 3) - Attitude&Behaviour game versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
4.7 Post-test proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
4.8 Post-test proportion of routes categorised as Safe - Table top training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
4.9 Post-test proportion of routes categorised as Safe - (Table top & roadside training) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
5 Attitude of 5 to 7 yr olds - post-test at 1 to 3 months	2	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
5.1 Post-test proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
5.2 Post-test proportion of routes categorised as Safe - Table top training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
5.3 Post-test proportion of routes categorised as Safe - (Table top & roadside training) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
6 Attitude of 5 to 7 yr olds - post-test at 7 to 9 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
6.1 Post-test proportion of routes categorised as Safe - (Table top & roadside training) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
7 Attitude of 7 to 8 yr olds - post-test at less than 1 month	1	Risk Ratio (M-H, Random, 95% CI)	Totals not selected
7.1 Apply "concept of speed"	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
8 Attitude (change) of 5 to 7 yr olds - post-test at less than 1 month	2	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected

8.1 Change in proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
8.2 Change in proportion of routes categorised as Safe - (Table top & roadside training) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
8.3 Change in proportion of routes categorised as Safe - Table top training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
9 Attitude (change) of 5 to 7 yr olds - post-test at 1 to 3 months	2	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
9.1 Change in proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
9.2 Change in proportion of routes categorised as Safe - (Table top & roadside training) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
9.3 Change in proportion of routes categorised as Safe - Table top training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
10 Knowledge of 5 to 7 yr olds - post-test at 4 to 6 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
10.1 Post-test score of "Crossing the street" test (maximum score 16)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
11 Knowledge (change) of 5 to 7 yr olds - post-test at 4 to 6 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
11.1 Change in score of "Crossing the street" test (maximum score 16)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]

Comparison 2. Indirect education versus No education

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Behaviour (observed) of 3 to 4 yr olds - post-test at 1 to 3 months	1		Risk Ratio (M-H, Random, 95% CI)	Totals not selected
1.1 Stop at kerb - no distraction	1		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.2 Stop at kerb - distraction (competition)	1		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]

1.3 Stop at kerb - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.4 Stop at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.5 Stop at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.6 Stop at line of vision - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.7 Stop & look at kerb - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.8 Stop & look at kerb - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.9 Stop & look at kerb - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.10 Stop & look at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.11 Stop & look at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.12 Stop & look at line of vision - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2 Behaviour (observed) of 3 to 4 yr olds - post-test at 4 to 6 months	1	Risk Ratio (M-H, Random, 95% CI)	Totals not selected
2.1 Stop at kerb - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.2 Stop at kerb - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.3 Stop at kerb - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.4 Stop at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.5 Stop at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.6 Stop at line of vision - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.7 Stop & look at kerb - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.8 Stop & look at kerb - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.9 Stop & look at kerb - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.10 Stop & look at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.11 Stop & look at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
2.12 Stop & look at line of vision - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
3 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month	2	Risk Ratio (M-H, Random, 95% CI)	Totals not selected

3.1 Stop at kerb - Parked cars - no distraction	2	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
3.2 Stop at kerb - Junctions - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
3.3 Stop at line of vision - Parked cars - no distraction	2	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
3.4 Look three times at line of vision - Parked cars - no distraction	2	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
3.5 Choose a position that offers a clear view - Junctions - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4 Behaviour (observed) of 5 to 7 yr olds - post-test at 1 to 3 months	4	Risk Ratio (M-H, Random, 95% CI)	Totals not selected
4.1 Stop at kerb - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.2 Stop at kerb - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.3 Stop at kerb - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.4 Stop at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.5 Stop at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.6 Stop at line of vision - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.7 Stop & look at kerb - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.8 Stop & look at kerb - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.9 Stop & look at kerb - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.10 Stop & look at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.11 Stop & look at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.12 Stop & look at line of vision - distraction (alone)	0	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.13 Stop at kerb - Parked cars - no distraction	2	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.14 Stop at kerb - Junctions - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.15 Stop at line of vision - Parked cars - no distraction	3	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.16 Look three times at line of vision - Parked cars - no distraction	2	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
4.17 Choose a position that offers a clear view - Junctions - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]

5 Behaviour (observed) of 5 to 7 yr olds - post-test at 4 to 6 months	1	Risk Ratio (M-H, Random, 95% CI)	Totals not selected
5.1 Stop at kerb - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.2 Stop at kerb - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.3 Stop at kerb - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.4 Stop at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.5 Stop at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.6 Stop at line of vision - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.7 Stop & look at kerb - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.8 Stop & look at kerb - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.9 Stop & look at kerb - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.10 Stop & look at line of vision - no distraction	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.11 Stop & look at line of vision - distraction (competition)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
5.12 Stop & look at line of vision - distraction (alone)	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
6 Behaviour (reported) of 5 to 7 yr olds - post-test at 4 to 6 months	1	Risk Ratio (M-H, Random, 95% CI)	Totals not selected
6.1 "Always cross in crosswalks" according to parents - Beltman program versus No training	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
6.2 "Always cross in crosswalks" according to parents - (Beltman+Booster) versus No training	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
6.3 "Always look before crossing" according to parents - Beltman program versus No training	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
6.4 "Always look before crossing" according to parents - (Beltman+Booster) versus No training	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
7 Attitude of 5 to 7 yr olds - post-test at less than 1 month	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
7.1 Post-test proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]

8 Attitude of 5 to 7 yr olds - post-test at 1 to 3 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
8.1 Post-test proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
9 Attitude (change) of 5 to 7 yr olds - post-test at less than 1 month	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
9.1 Change in proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
9.2 Change in proportion of routes categorised as Safe or More safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
10 Attitude (change) of 5 to 7 yr olds - post-test at 1 to 3 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
10.1 Change in proportion of routes categorised as Safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
10.2 Change in proportion of routes categorised as Safe or More safe - Roadside training versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
11 Knowledge of 3 yr olds - post-test at 1 to 3 months	1	Risk Ratio (M-H, Random, 95% CI)	Totals not selected
11.1 ”Hold hands” - Road safety booklet after an interview versus Interview only	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
11.2 ”Hold hands” - Road safety booklet with a letter versus No intervention	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
11.3 ”Walk / stay on pavement” - Road safety booklet after an interview versus Interview only	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
11.4 ”Walk / stay on pavement” - Road safety booklet with a letter versus No intervention	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
11.5 ”Look / watch out for cars” - Road safety booklet after an interview versus Interview only	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
11.6 ”Look / watch out for cars” - Road safety booklet with a letter versus No intervention	1	Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]

12 Knowledge of 5 to 7 yr olds - post-test at less than 1 month	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
12.1 Post-test score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
12.2 Post-test score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
13 Knowledge of 5 to 7 yr olds - post-test at 4 to 6 months	2	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
13.1 Post-test score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
13.2 Post-test score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
13.3 Post-test score of "Cognitive" test (maximum score 54)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
14 Knowledge of 7 to 9 yr olds - post-test at 4 to 6 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
14.1 Post-test score of "Cognitive" test (maximum score 64)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
15 Knowledge of 8 to 11 yr olds - post-test at less than 1 month	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
15.1 Post-test score of "Conspicuity, mass, speed and control" test (maximum score 100)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
16 Knowledge of 10 to 13 yr olds - post-test at 4 to 6 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
16.1 Post-test score of "Cognitive" test (maximum score 64)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
17 Knowledge (change) of 5 to 7 yr olds - post-test at less than 1 month	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
17.1 Change in score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]

17.2 Change in score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
18 Knowledge (change) of 5 to 7 yr olds - post-test at 4 to 6 months	2	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
18.1 Change in score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
18.2 Change in score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
18.3 Change in score of "Cognitive" test (maximum score 54)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
19 Knowledge (change) of 7 to 9 yr olds - post-test at 4 to 6 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
19.1 Change in score of "Cognitive" test (maximum score 64)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
20 Knowledge (change) of 10 to 13 yr olds - post-test at 4 to 6 months	1	Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
20.1 Change in score of "Cognitive" test (maximum score 64)	1	Std. Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]

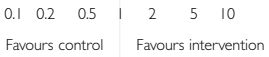
Analysis 1.1. Comparison 1 Direct education compared to No education, Outcome 1 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 1 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
1 Safe behaviour - Detailed caution vs No caution				
Nishioka 1991	14/23	6/24		2.43 [1.13, 5.24]
2 Safe behaviour - Simple caution vs No caution				
Nishioka 1991	11/24	6/24		1.83 [0.81, 4.15]



Analysis 1.2. Comparison 1 Direct education compared to No education, Outcome 2 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 2 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test Transfer Score (maximum score 31) - Attitude game versus No training						
Renaud 1989	33	8.7 (3.1)	30	7.9 (3.7)		0.23 [-0.26, 0.73]
2 Post-test Transfer Score (maximum score 31) - Behaviour game versus No training						
Renaud 1989	32	10.4 (2.1)	30	7.9 (3.7)		0.83 [0.31, 1.35]
3 Post-test Transfer Score (maximum score 31) - Attitude%Behaviour game versus No training						
Renaud 1989	33	10.1 (2.3)	30	7.9 (3.7)		0.71 [0.20, 1.22]

Analysis 1.3. Comparison 1 Direct education compared to No education, Outcome 3 Behaviour (observed) of institutionalised adults - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 3 Behaviour (observed) of institutionalised adults - post-test at less than 1 month

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
1 Post-test mean proportion of steps correct - classroom versus control				
Matson 1980	100/130	21/130		4.76 [3.18, 7.12]
2 Post-test mean proportion of steps correct - "independence" versus control				
Matson 1980	117/130	21/130		5.57 [3.75, 8.28]

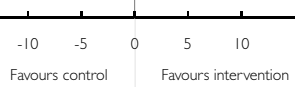
Analysis 1.4. Comparison 1 Direct education compared to No education, Outcome 4 Attitude of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 4 Attitude of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test Behaviour Score (maximum score 5) - Attitude game versus No training						
Renaud 1989	35	4.9 (0.2)	34	4 (1.1)		1.13 [0.62, 1.64]
2 Post-test Behaviour Score (maximum score 5) - Behaviour game versus No training						
Renaud 1989	33	4.3 (0.8)	34	4 (1.1)		0.31 [-0.17, 0.79]
3 Post-test Behaviour Score (maximum score 5) - Attitude%Behaviour game versus No training						
Renaud 1989	34	4.5 (0.7)	34	4 (1.1)		0.54 [0.05, 1.02]
4 Post-test Attitude Score (maximum score 3) - Attitude game versus No training						
Renaud 1989	35	1.9 (0.7)	33	1.3 (0.7)		0.85 [0.35, 1.35]
5 Post-test Attitude Score (maximum score 3) - Behaviour game versus No training						
Renaud 1989	33	1.8 (0.6)	33	1.3 (0.7)		0.76 [0.26, 1.26]
6 Post-test Attitude Score (maximum score 3) - Attitude%Behaviour game versus No training						
Renaud 1989	34	2 (0.7)	33	1.3 (0.7)		0.99 [0.48, 1.50]
7 Post-test proportion of routes categorised as Safe - Roadside training versus No training						
Thomson 1992	10	0.35 (0.21)	10	0.12 (0.25)		0.95 [0.02, 1.89]
8 Post-test proportion of routes categorised as Safe - Table top training versus No training						
Thomson 1992	10	0.37 (0.21)	10	0.12 (0.25)		1.04 [0.09, 1.98]
9 Post-test proportion of routes categorised as Safe - (Table top % roadside training) versus No training						
Thomson 1998	30	0.43 (0.31)	30	0.13 (0.09)		1.30 [0.74, 1.86]



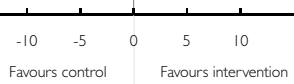
Analysis 1.5. Comparison 1 Direct education compared to No education, Outcome 5 Attitude of 5 to 7 yr olds - post-test at 1 to 3 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 5 Attitude of 5 to 7 yr olds - post-test at 1 to 3 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test proportion of routes categorised as Safe - Roadside training versus No training						
Thomson 1992	10	0.34 (0.18)	10	0.12 (0.24)		0.99 [0.05, 1.93]
2 Post-test proportion of routes categorised as Safe - Table top training versus No training						
Thomson 1992	10	0.37 (0.16)	10	0.12 (0.24)		1.17 [0.21, 2.14]
3 Post-test proportion of routes categorised as Safe - (Table top % roadside training) versus No training						
Thomson 1998	30	0.35 (0.29)	30	0.16 (0.19)		0.76 [0.24, 1.29]



Analysis 1.6. Comparison 1 Direct education compared to No education, Outcome 6 Attitude of 5 to 7 yr olds - post-test at 7 to 9 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 6 Attitude of 5 to 7 yr olds - post-test at 7 to 9 months

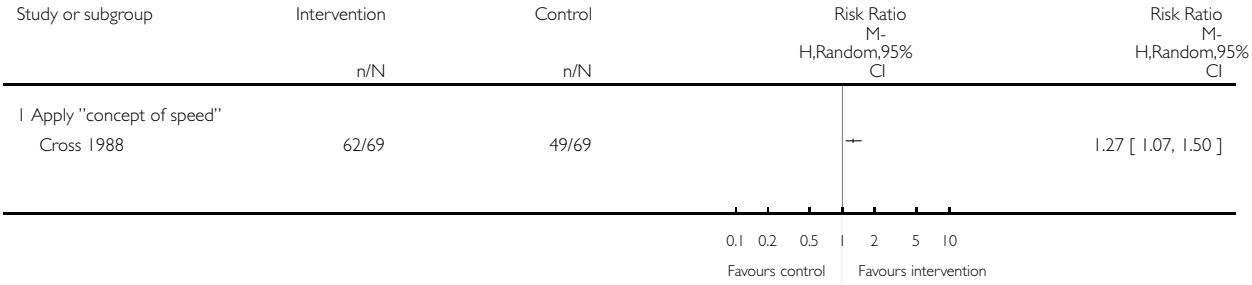
Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test proportion of routes categorised as Safe - (Table top % roadside training) versus No training						
Ampofo-Boateng 1993	10	0.38 (0.23)	10	0.12 (0.15)		1.28 [0.30, 2.26]

Analysis 1.7. Comparison 1 Direct education compared to No education, Outcome 7 Attitude of 7 to 8 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 7 Attitude of 7 to 8 yr olds - post-test at less than 1 month

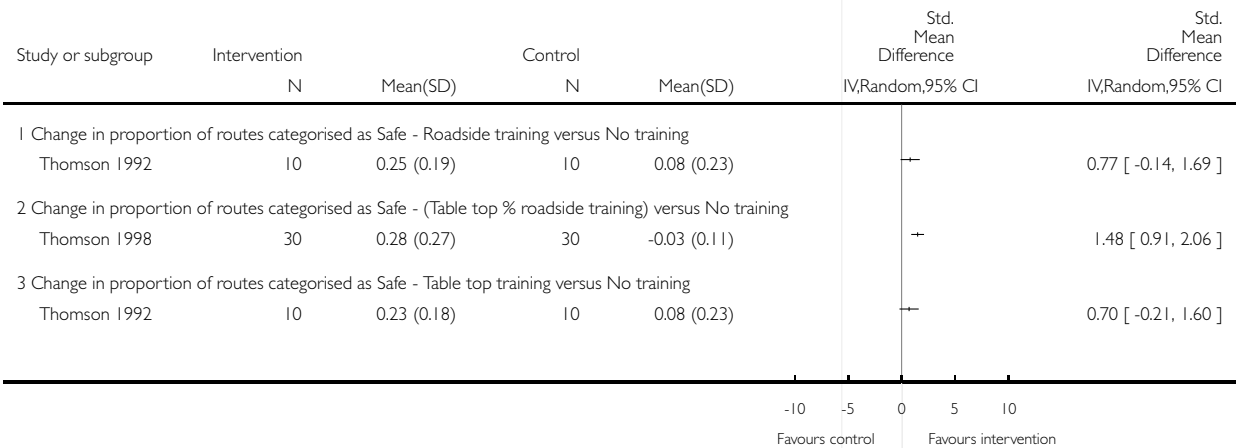


Analysis 1.8. Comparison 1 Direct education compared to No education, Outcome 8 Attitude (change) of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 8 Attitude (change) of 5 to 7 yr olds - post-test at less than 1 month



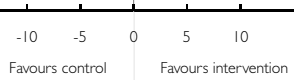
Analysis 1.9. Comparison 1 Direct education compared to No education, Outcome 9 Attitude (change) of 5 to 7 yr olds - post-test at 1 to 3 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 9 Attitude (change) of 5 to 7 yr olds - post-test at 1 to 3 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Change in proportion of routes categorised as Safe - Roadside training versus No training						
Thomson 1992	10	0.24 (0.16)	10	0.08 (0.22)		0.80 [-0.12, 1.72]
2 Change in proportion of routes categorised as Safe - (Table top % roadside training) versus No training						
Thomson 1998	30	0.2 (0.25)	30	0 (0.17)		0.92 [0.39, 1.46]
3 Change in proportion of routes categorised as Safe - Table top training versus No training						
Thomson 1992	10	0.23 (0.14)	10	0.08 (0.22)		0.78 [-0.14, 1.70]



Analysis 1.10. Comparison 1 Direct education compared to No education, Outcome 10 Knowledge of 5 to 7 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 10 Knowledge of 5 to 7 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test score of "Crossing the street" test (maximum score 16)						
Luria 2000	90	6.21 (2.5)	91	5.63 (2.6)		0.23 [-0.07, 0.52]

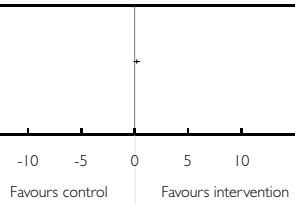
Analysis 1.11. Comparison 1 Direct education compared to No education, Outcome 11 Knowledge (change) of 5 to 7 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 1 Direct education compared to No education

Outcome: 11 Knowledge (change) of 5 to 7 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Change in score of "Crossing the street" test (maximum score 16)						
Luria 2000	90	1.9 (2.7)	91	1.4 (3.5)		0.16 [-0.13, 0.45]

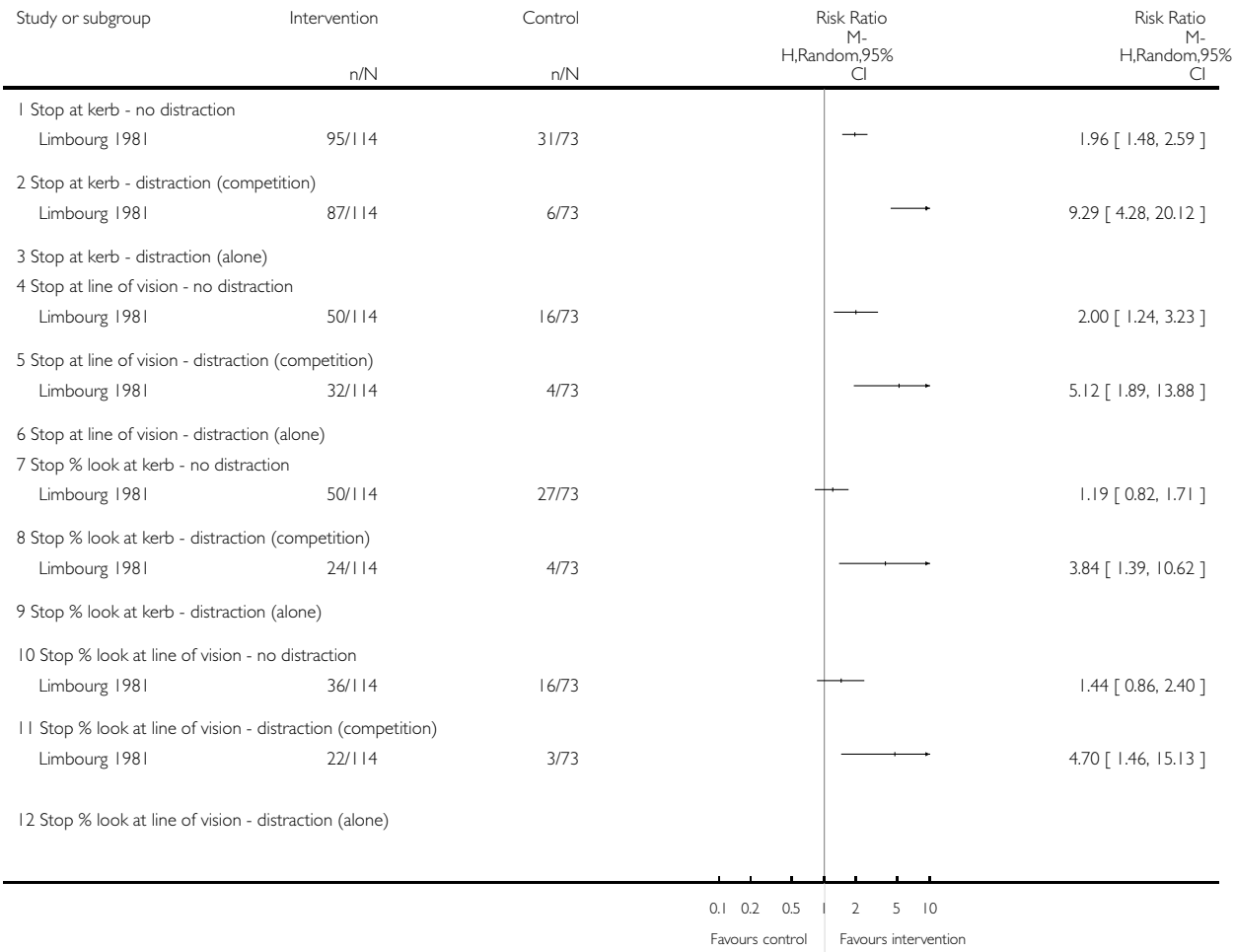


Analysis 2.1. Comparison 2 Indirect education versus No education, Outcome 1 Behaviour (observed) of 3 to 4 yr olds - post-test at 1 to 3 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 1 Behaviour (observed) of 3 to 4 yr olds - post-test at 1 to 3 months

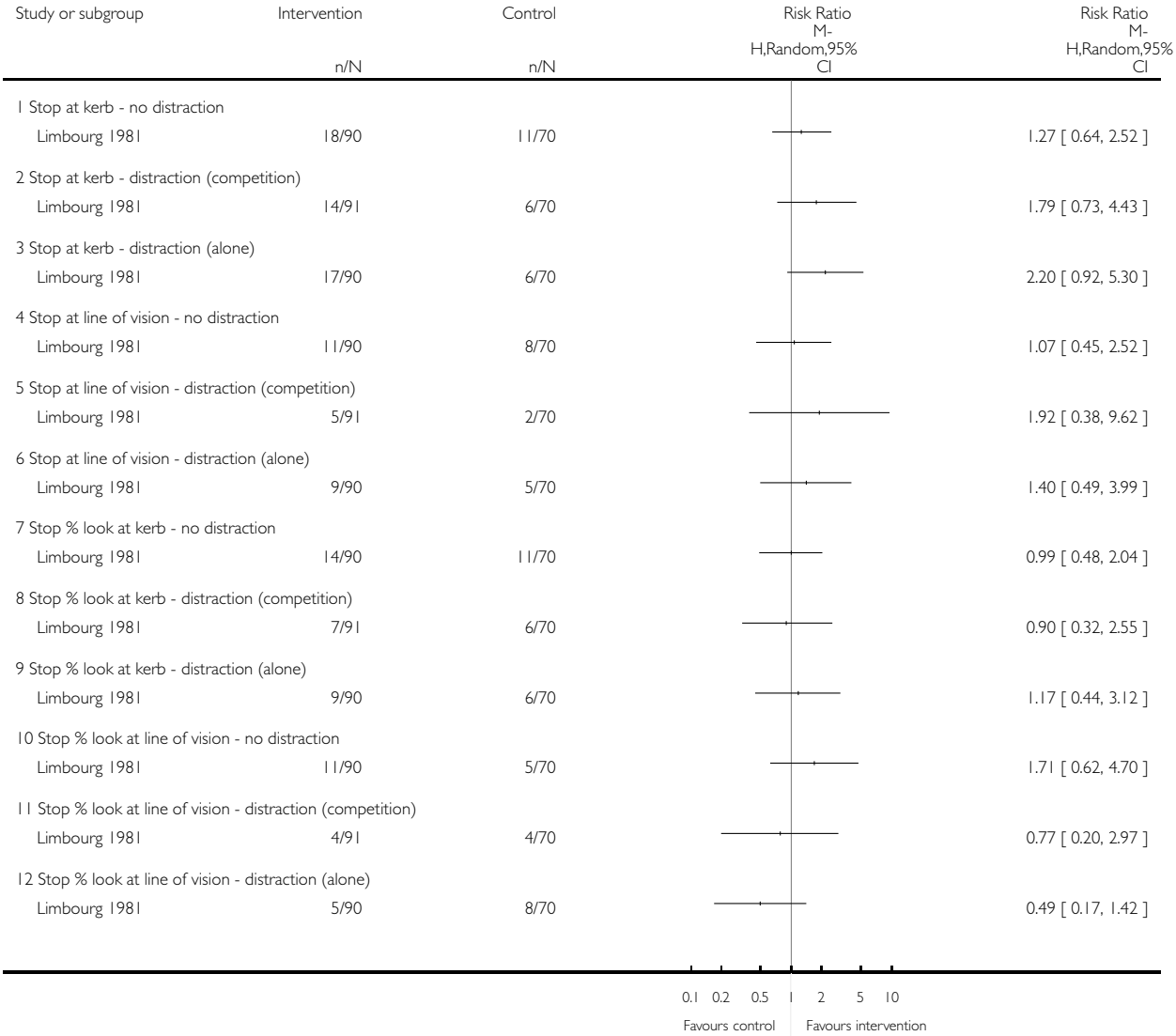


Analysis 2.2. Comparison 2 Indirect education versus No education, Outcome 2 Behaviour (observed) of 3 to 4 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 2 Behaviour (observed) of 3 to 4 yr olds - post-test at 4 to 6 months



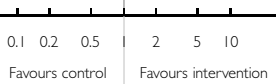
Analysis 2.3. Comparison 2 Indirect education versus No education, Outcome 3 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 3 Behaviour (observed) of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
1 Stop at kerb - Parked cars - no distraction				
Thomson 1997a	63/66	24/36		1.43 [1.13, 1.81]
Thomson 1997b	52/53	33/38		1.13 [0.99, 1.29]
2 Stop at kerb - Junctions - no distraction				
Thomson 1997b	56/57	27/31		1.13 [0.98, 1.30]
3 Stop at line of vision - Parked cars - no distraction				
Thomson 1997a	61/66	20/36		1.66 [1.23, 2.25]
Thomson 1997b	50/53	14/38		2.56 [1.68, 3.90]
4 Look three times at line of vision - Parked cars - no distraction				
Thomson 1997a	56/66	18/36		1.70 [1.21, 2.39]
Thomson 1997b	48/53	13/38		2.65 [1.69, 4.15]
5 Choose a position that offers a clear view - Junctions - no distraction				
Thomson 1997b	42/57	19/31		1.20 [0.87, 1.66]



Analysis 2.4. Comparison 2 Indirect education versus No education, Outcome 4 Behaviour (observed) of 5 to 7 yr olds - post-test at 1 to 3 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 4 Behaviour (observed) of 5 to 7 yr olds - post-test at 1 to 3 months

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
1 Stop at kerb - no distraction				
Limbourg 1981	136/166	104/186		1.47 [1.27, 1.70]
2 Stop at kerb - distraction (competition)				
Limbourg 1981	133/166	24/186		6.21 [4.24, 9.09]
3 Stop at kerb - distraction (alone)				
4 Stop at line of vision - no distraction				
Limbourg 1981	110/166	80/186		1.54 [1.26, 1.88]
5 Stop at line of vision - distraction (competition)				
Limbourg 1981	91/166	20/186		5.10 [3.30, 7.89]
6 Stop at line of vision - distraction (alone)				
7 Stop % look at kerb - no distraction				
Limbourg 1981	88/166	95/186		1.04 [0.85, 1.27]
8 Stop % look at kerb - distraction (competition)				
Limbourg 1981	83/166	20/186		4.65 [2.99, 7.23]
9 Stop % look at kerb - distraction (alone)				
10 Stop % look at line of vision - no distraction				
Limbourg 1981	105/166	84/186		1.40 [1.15, 1.70]
11 Stop % look at line of vision - distraction (competition)				
Limbourg 1981	71/166	20/186		3.98 [2.54, 6.24]
12 Stop % look at line of vision - distraction (alone)				
13 Stop at kerb - Parked cars - no distraction				
Thomson 1997a	62/66	26/36		1.30 [1.05, 1.61]
Thomson 1997b	53/53	37/38		1.03 [0.96, 1.10]
14 Stop at kerb - Junctions - no distraction				
Thomson 1997b	56/57	31/31		0.99 [0.93, 1.05]
15 Stop at line of vision - Parked cars - no distraction				
Ampofo-Boateng 1993	111/119	40/74		1.73 [1.39, 2.14]
Thomson 1997a	63/66	20/36		1.72 [1.28, 2.31]

(*Continued* . . .)

(. . . *Continued*)

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
Thomson 1997b	48/53	20/38		1.72 [1.26, 2.36]
16 Look three times at line of vision - Parked cars - no distraction				
Thomson 1997a	57/66	16/36		1.94 [1.33, 2.83]
Thomson 1997b	45/53	16/38		2.02 [1.37, 2.98]
17 Choose a position that offers a clear view - Junctions - no distraction				
Thomson 1997b	43/57	20/31		1.17 [0.87, 1.58]

Analysis 2.5. Comparison 2 Indirect education versus No education, Outcome 5 Behaviour (observed) of 5 to 7 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 5 Behaviour (observed) of 5 to 7 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
1 Stop at kerb - no distraction				
Limbourg 1981	47/150	48/167		1.09 [0.78, 1.53]
2 Stop at kerb - distraction (competition)				
Limbourg 1981	31/149	17/167		2.04 [1.18, 3.54]
3 Stop at kerb - distraction (alone)				
Limbourg 1981	42/150	28/167		1.67 [1.09, 2.55]
4 Stop at line of vision - no distraction				
Limbourg 1981	51/150	20/167		2.84 [1.78, 4.53]
5 Stop at line of vision - distraction (competition)				
Limbourg 1981	30/149	10/167		3.36 [1.70, 6.64]

(*Continued* . . .)

(. . . *Continued*)

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
6 Stop at line of vision - distraction (alone)				
Limbourg 1981	45/150	25/167		2.00 [1.30, 3.10]
7 Stop % look at kerb - no distraction				
Limbourg 1981	44/150	42/167		1.17 [0.81, 1.67]
8 Stop % look at kerb - distraction (competition)				
Limbourg 1981	28/149	13/167		2.41 [1.30, 4.49]
9 Stop % look at kerb - distraction (alone)				
Limbourg 1981	35/150	25/167		1.56 [0.98, 2.48]
10 Stop % look at line of vision - no distraction				
Limbourg 1981	45/150	28/167		1.79 [1.18, 2.72]
11 Stop % look at line of vision - distraction (competition)				
Limbourg 1981	25/149	10/167		2.80 [1.39, 5.64]
12 Stop % look at line of vision - distraction (alone)				
Limbourg 1981	32/150	22/167		1.62 [0.99, 2.66]

Analysis 2.6. Comparison 2 Indirect education versus No education, Outcome 6 Behaviour (reported) of 5 to 7 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 6 Behaviour (reported) of 5 to 7 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
1 "Always cross in crosswalks" according to parents - Beltman program versus No training				
Miller 1982	19/37	10/44		2.26 [1.20, 4.24]
2 "Always cross in crosswalks" according to parents - (Beltman+Booster) versus No training				
Miller 1982	14/52	10/44		1.18 [0.59, 2.40]
3 "Always look before crossing" according to parents - Beltman program versus No training				
Miller 1982	20/37	17/44		1.40 [0.87, 2.25]
4 "Always look before crossing" according to parents - (Beltman+Booster) versus No training				
Miller 1982	35/52	17/44		1.74 [1.15, 2.65]

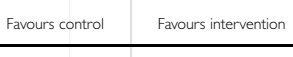
Analysis 2.7. Comparison 2 Indirect education versus No education, Outcome 7 Attitude of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 7 Attitude of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test proportion of routes categorised as Safe - Roadside training versus No training						
Thomson 1997a	50	0.26 (0.23)	57	0.15 (0.2)		0.51 [0.12, 0.90]



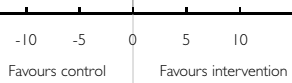
Analysis 2.8. Comparison 2 Indirect education versus No education, Outcome 8 Attitude of 5 to 7 yr olds - post-test at 1 to 3 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 8 Attitude of 5 to 7 yr olds - post-test at 1 to 3 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test proportion of routes categorised as Safe - Roadside training versus No training						
Thomson 1997a	50	0.21 (0.18)	57	0.19 (0.21)		0.10 [-0.28, 0.48]



Analysis 2.9. Comparison 2 Indirect education versus No education, Outcome 9 Attitude (change) of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 9 Attitude (change) of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Change in proportion of routes categorised as Safe - Roadside training versus No training						
Thomson 1997a	50	0.19 (0.2)	57	0.07 (0.17)		0.65 [0.26, 1.04]
2 Change in proportion of routes categorised as Safe or More safe - Roadside training versus No training						
Thomson 1997a	50	0.26 (0.23)	57	0.15 (0.2)		0.51 [0.12, 0.90]

Analysis 2.10. Comparison 2 Indirect education versus No education, Outcome 10 Attitude (change) of 5 to 7 yr olds - post-test at 1 to 3 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 10 Attitude (change) of 5 to 7 yr olds - post-test at 1 to 3 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Change in proportion of routes categorised as Safe - Roadside training versus No training						
Thomson 1997a	50	0.14 (0.16)	57	0.11 (0.18)		0.17 [-0.21, 0.55]
2 Change in proportion of routes categorised as Safe or More safe - Roadside training versus No training						
Thomson 1997a	50	0.21 (0.18)	57	0.19 (0.21)		0.10 [-0.28, 0.48]

Analysis 2.11. Comparison 2 Indirect education versus No education, Outcome 11 Knowledge of 3 yr olds - post-test at 1 to 3 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 11 Knowledge of 3 yr olds - post-test at 1 to 3 months

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
1 "Hold hands" - Road safety booklet after an interview versus Interview only				
Downing 1981	40/118	49/104		0.72 [0.52, 0.99]
2 "Hold hands" - Road safety booklet with a letter versus No intervention				
Downing 1981	157/435	71/223		1.13 [0.90, 1.43]
3 "Walk / stay on pavement" - Road safety booklet after an interview versus Interview only				
Downing 1981	21/118	25/104		0.74 [0.44, 1.24]
4 "Walk / stay on pavement" - Road safety booklet with a letter versus No intervention				
Downing 1981	87/435	36/223		1.24 [0.87, 1.76]
5 "Look / watch out for cars" - Road safety booklet after an interview versus Interview only				
Downing 1981	17/118	9/104		1.66 [0.78, 3.57]
6 "Look / watch out for cars" - Road safety booklet with a letter versus No intervention				
Downing 1981	52/435	20/223		1.33 [0.82, 2.18]

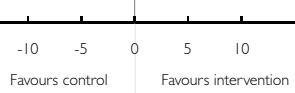
Analysis 2.12. Comparison 2 Indirect education versus No education, Outcome 12 Knowledge of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 12 Knowledge of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training						
Miller 1982	169	17.99 (1.88)	181	15.63 (2.83)		0.97 [0.75, 1.20]
2 Post-test score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training						
Miller 1982	188	18.22 (2.05)	181	15.63 (2.83)		1.05 [0.83, 1.27]



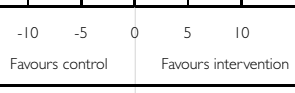
Analysis 2.13. Comparison 2 Indirect education versus No education, Outcome 13 Knowledge of 5 to 7 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 13 Knowledge of 5 to 7 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training						
Miller 1982	158	18.06 (1.92)	179	16.31 (2.58)		0.76 [0.54, 0.98]
2 Post-test score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training						
Miller 1982	181	18.27 (1.74)	179	16.31 (2.58)		0.89 [0.67, 1.11]
3 Post-test score of "Cognitive" test (maximum score 54)						
Singh 1979	748	34.1 (10.5)	615	30.45 (6.45)		0.41 [0.30, 0.52]



Analysis 2.14. Comparison 2 Indirect education versus No education, Outcome 14 Knowledge of 7 to 9 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 14 Knowledge of 7 to 9 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test score of "Cognitive" test (maximum score 64)						
Singh 1979	768	44.86 (10.85)	528	33.56 (11.12)		1.03 [0.91, 1.15]

Analysis 2.15. Comparison 2 Indirect education versus No education, Outcome 15 Knowledge of 8 to 11 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 15 Knowledge of 8 to 11 yr olds - post-test at less than 1 month

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test score of "Conspicuity, mass, speed and control" test (maximum score 100)						
Bouck 1992	16	83.3 (10.6)	16	35.7 (25.3)		2.39 [1.46, 3.33]

Analysis 2.16. Comparison 2 Indirect education versus No education, Outcome 16 Knowledge of 10 to 13 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 16 Knowledge of 10 to 13 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Post-test score of "Cognitive" test (maximum score 64)						
Singh 1979	784	35.46 (7.09)	581	31.75 (8.26)		0.49 [0.38, 0.60]

Analysis 2.17. Comparison 2 Indirect education versus No education, Outcome 17 Knowledge (change) of 5 to 7 yr olds - post-test at less than 1 month.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 17 Knowledge (change) of 5 to 7 yr olds - post-test at less than 1 month

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Change in score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training						
Miller 1982	170	4.77 (2.67)	178	1.89 (3.04)		1.00 [0.78, 1.23]
2 Change in score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training						
Miller 1982	202	4.82 (2.74)	178	1.89 (3.04)		1.01 [0.80, 1.23]

Analysis 2.18. Comparison 2 Indirect education versus No education, Outcome 18 Knowledge (change) of 5 to 7 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 18 Knowledge (change) of 5 to 7 yr olds - post-test at 4 to 6 months

Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Change in score of "Traffic safety knowledge" test (maximum score 20) - Beltman program versus No training						
Miller 1982	170	4.84 (2.68)	178	2.57 (2.95)		0.80 [0.58, 1.02]
2 Change in score of "Traffic safety knowledge" test (maximum score 20) - (Beltman+Booster) versus No training						
Miller 1982	202	4.87 (2.7)	178	2.57 (2.95)		0.81 [0.60, 1.02]
3 Change in score of "Cognitive" test (maximum score 54)						
Singh 1979	748	6.18 (9.18)	615	2.35 (6.85)		0.47 [0.36, 0.57]

Analysis 2.19. Comparison 2 Indirect education versus No education, Outcome 19 Knowledge (change) of 7 to 9 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 19 Knowledge (change) of 7 to 9 yr olds - post-test at 4 to 6 months

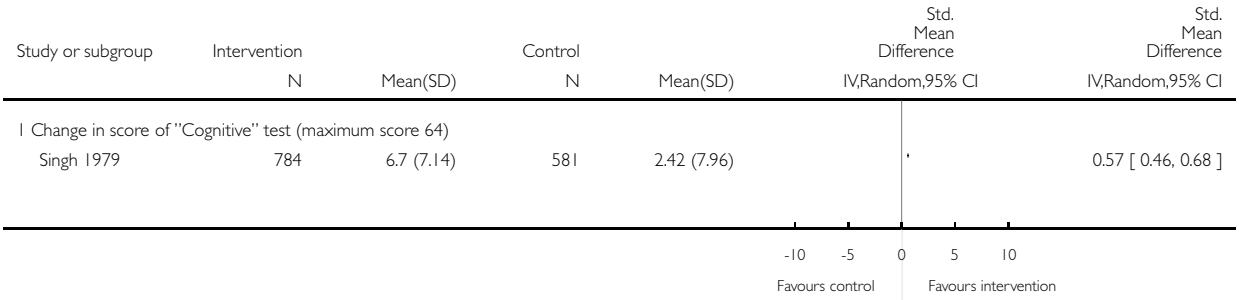
Study or subgroup	Intervention N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Std. Mean Difference IV,Random,95% CI
1 Change in score of "Cognitive" test (maximum score 64)						
Singh 1979	768	12.66 (11.46)	528	1.74 (11.12)		0.96 [0.85, 1.08]

Analysis 2.20. Comparison 2 Indirect education versus No education, Outcome 20 Knowledge (change) of 10 to 13 yr olds - post-test at 4 to 6 months.

Review: Safety education of pedestrians for injury prevention

Comparison: 2 Indirect education versus No education

Outcome: 20 Knowledge (change) of 10 to 13 yr olds - post-test at 4 to 6 months



APPENDICES

Appendix 1. Search strategy

The following general search strategy was used for all databases:
(pedestrian OR synonyms) AND (education OR synonyms) AND (traffic OR road OR crossing OR safety OR injury OR accident OR synonyms).
When appropriate MESH terms (or equivalent) and free text with truncation were used, and searches were restricted to title, abstract and keywords fields.
Searches were also conducted with keywords translated into French, German, Italian, Spanish, Dutch, Danish.

Language	**Concept A**	**Concept B**	**Concept C**	**Concept D**
	pedestrian	education /safety education / prevention	road trafic accident / road crossing	injury/accident outcomes(injury, mortality, disability)
English	pedestr* walker* walkin*	educat* teach* informat* train* instruct* safe* preven*	accident* road* street* traf?ic* crossin* crash*	injur* fatal* mortal* emergenc* ho?pital* disab*

(*Continued*)

		securit*	mot* near3 vehic?l* car cars automob*	AIS ISS trauma* handicap*
French	pieton*	educat* informat* instruct* preven* securit* formation* enseigne*	rue* route* routier* collision* voiture*	mortal* urgences ho?pital* trauma* handicap* bless*
German	Fussganger- FussgängerGeher Gehenspazier*Zu Fuß	Unter- weis*Lehr*Unterricht*Inform Instruk* Sicher*gesichertVerkehrssiche	Un- fall*Unglu*Verunglu*Landstr Fussgaengerueberweg* UnfallZusammen- sto*AutoPKWKraftwagen AutoAutosAutoAutos Personenkraftwagen Auto- mobil*	Ver- letz*SchadenPersonenschaden Todlich*tödlich* Fa- tal*Todlich*MortalitaetSterblichkeit*Notfall* Behinder* Korper- beh*Trauma* Beeintra- cht*Beeinträcht*schwer*
Italian	pe- don*deambulazionecammino	formazioneforma- tivoprevenzionein- segnamentodidat- tic*informazion*allieviistruzi	acci- dent*incident*infortuni*strac	traum*dann*lesion*fatal*letal*
Spanish	peatonmarchadeambula- cioncaminar.andar	edu- cati*docenciadocenteensenan	acci- dent*caminoencrucijadavialat automo*	heridas- trauma*lesion*muert*letal*fa
Dutch	voetg*wandel*lopen*loop*	edu- cat*leren*onderw*informat*t	on- geluk*weg*straat*verkeer*zeb	ongelukdo- delijk*noodgevalhospitaalzie
Danish	fodgaengerga	uddannelselaereinforma- tiontoginstruktionsikker- forebyggelsesikkermed	ulykkevejgadetrafikkryd- sesammenstodkoretojbilbil- erautomobil	skadefataldodnodsitua- tionkritiskhospitalsygemus- invalidtraumehandikap
Comments	a) words relating to one concept were combined by OR b) combination of concepts: A AND B AND (C OR D) c) searches in each language were run separately			

WHAT'S NEW

Last assessed as up-to-date: 23 February 2005.

Date	Event	Description
14 March 2012	Amended	The risk of bias table has been updated to conform to the latest version of the Cochrane Handbook

HISTORY

Protocol first published: Issue 2, 1999

Review first published: Issue 2, 2002

Date	Event	Description
13 June 2008	Amended	Converted to new review format.
23 February 2005	New citation required and conclusions have changed	Substantive amendment. New studies found and included or excluded.
25 May 2003	New search has been performed	New studies found but not yet included or excluded. The search was updated in May 2003 for papers published between 1999 and 2003 (Feb). From the 1623 hits, 277 were relevant, 18 were added to the excluded section, four to the waiting assessment section and none to the included section

CONTRIBUTIONS OF AUTHORS

OD designed the protocol, searched databases, screened records, extracted data, contacted authors and wrote the review. IR helped design the protocol and write the review. FB helped design the protocol, extract data and write the review.

DECLARATIONS OF INTEREST

None known.

SOURCES OF SUPPORT

Internal sources

- Cochrane Injuries Grant, UK.
- Institut de Médecine Sociale et Préventive, 1211 GENEVE 4, Switzerland.

External sources

- Medical Research Council, UK.

NOTES

Seaches updated in May 2003: no study included, 4 studies pending, 19 studies excluded.

INDEX TERMS

Medical Subject Headings (MeSH)

*Safety; *Walking; Accidents, Traffic [*prevention & control]; Program Evaluation; Randomized Controlled Trials as Topic; Wounds and Injuries [*prevention & control]

MeSH check words

Humans