

SPORTS AND RECREATION INJURY PREVENTION STRATEGIES: A SYSTEMATIC REVIEW

British Columbia Injury Research and Prevention Unit (BCIRPU)

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INTRODUCTION

Most children and youth participate in sport and recreational activities on a regular basis. Participation in sport and recreational activities is promoted for a variety of reasons including; social interaction, skill development, stress reduction, enjoyment, fitness, prevention of chronic diseases, well-being, and a sense of belonging. Exercise is an important element in promoting and improving health while sports and recreational activities of almost any kind are beneficial for the individual, as well as for society as a whole. However, twenty to twenty-five percent of injuries to children and youth result from participation in sport and recreation activities.

The purpose of this project is to synthesize the research evidence on the effectiveness of strategies to prevent sport and recreation injuries among children and youth and to disseminate the findings to both academic and community-based users. Because of the rigorous, explicit and reproducible way in which the systematic review is conducted, it provides the most reliable method for synthesizing research evidence. This systematic review process was adapted to suit the particular needs of this project.

METHODS

Focus of Study

As an initial step, an expert panel was established to provide an opportunity for input into; protocol, methods, synthesis of findings and dissemination of results. Sport and recreation injuries most frequently presenting to emergency departments and considered most severe were selected for review. These activities were identified using the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP)¹ database for children and youth (0-19 years) and consultation with the Expert Panel.

Identification of Eligible Documents

A search filter (a series of subject-related keywords used to extract potentially relevant articles from a computerized database) was first developed, tested and refined for each randomly selected sport. Eight electronic databases were searched using this broad filter, with the addition of each specific sport and cross-cultural synonyms for that sport. All were searched from the earliest records, for all languages and all age groups.

Relevance

One member of the team screened each potentially relevant citation, including the abstract when available, using broad inclusion/exclusion criteria. This initial screening resulted in a smaller number of potentially relevant documents for possible inclusion. Hard copies of all articles identified at this stage were retrieved using library resources.

A relevance instrument to assess the eligibility of each study was drafted. All seven members of the research team participated in the pilot testing of 15 randomly selected potentially relevant articles. Consensus meetings were held and the relevance form was revised accordingly.

Two independent reviewers assessed the relevance of each study identified for potential inclusion in the review. Disagreements were resolved by discussion between the two reviewers and when necessary a third member of the research team. Relevant articles not identified through the database searches are being identified by handsearching the following:

- sport injury textbooks (after 1990)
- published and unpublished reports
- review articles
- sampling of relevant articles
- expert recommendations

Review of Studies

Quality Assessment

In order to assess the scientific quality of studies including non-RCTs, cohorts, case-controls and one-group pretest-posttest designs appropriate instruments were required. Steps included:

- identification and review of existing quality assessment instruments
- creation of draft instrument
- external consultation and ranking of items by methodological experts
- research team ranking instrument items
- eliminate items identified as low priority or use
- draft, test, revise instruments

Data Extraction

A data extraction instrument was developed to collect descriptive data from each relevant study.

A review of existing data extraction instruments used in previous systematic reviews was conducted. An instrument was drafted based on the literature review and consultation from expert panel members regarding key areas. Revisions were made based on expert feedback and team consensus from pilot testing.

Two independent reviewers will complete the quality assessment and data extraction on each relevant article. Disagreements will be resolved by discussion between the two and when necessary a third member of the research team.

¹ Data from British Columbia Children's Hospital and the Children's Hospital of Eastern Ontario

CONCLUSIONS

This approach uses explicit and reproducible methods for identifying and selecting studies and grades the strength of evidence of each study. A summary of findings on the effectiveness of sport and recreation injury prevention strategies will be compiled and used to inform research and policy. Best practices guidelines, aimed at community-based practitioners, will be distilled from the findings of the full research report. These guidelines will be developed with input from a community-based advisory group. Recommendations of "best practices" for injury prevention among children and youth in sport and recreation will be accompanied by a rating of the strength of evidence.

Results of this study will provide input to a number of provincial initiatives and stakeholder groups.

- school-based initiative including programs and special events
- provincial sport injury prevention framework
- public health initiatives
- community based sport and recreation injury prevention programs
- provincial sport organizations

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RESULTS

Identified Sport and Recreation Activities

Twenty-seven sport and recreation activities were identified by

- 1) examining CHIRPP data for frequency of injuries resulting in a short stay in emergency department or hospital admittance and,
- 2) consultation with the expert panel

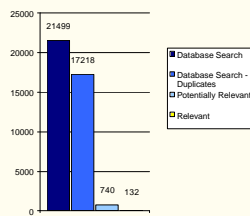
Downhill Skiing	Horseback Riding	Golf
Soccer	Sledging	Marital Arts
Ice Hockey	Skateboarding	Wrestling
Snowboarding	Swimming	Track and Field
Football	Gymnastics	Volleyball
Trampolineing	Ringette	Street Hockey
In-line Skating	Field Hockey	Cycling (Post 1996)
Basketball	Rugby	General Sport and Recreation
Baseball	Roller Hockey	

Relevance Criteria:

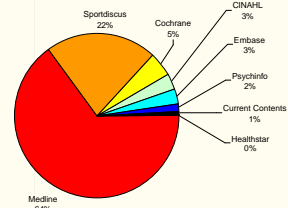
Relevance criteria was determined to include the following:

- address sport and/or recreation unintentional injury prevention (IP)
- address injury prevention in one of 27 specific sport or multiple sport areas
- address cycling injury prevention (written or published 1997 or later)
- evaluate effectiveness of either 1) IP program/strategy, 2) policy/regulation/legislative change, 3) community organization effort, 4) environmental, equipment or product modification
- contain one of the following outcome measures 1) injury incidence, 2) injury severity, 3) uptake of risk reducing behaviours, 4) uptake or compliance with IP measures or 5) a biomechanical measure related to injury
- contain a control group in methodological design or other comparative measures

Retrieval Progression



Relevant Articles by Database



Quality Assessment Instrument

Four tailored instruments have been developed to assess the scientific quality of studies including non-RCTs, cohorts, case-controls and one-group pretest-posttest designs.

Areas of quality assessment include:

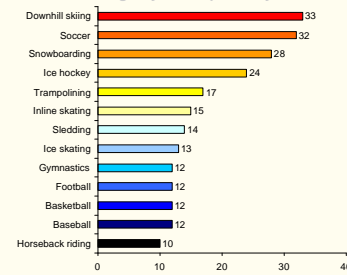
- reporting
- external validity (generalizability)
- internal validity (selection bias or confounding)
- internal validity (assessment bias)

Data Extraction Instrument

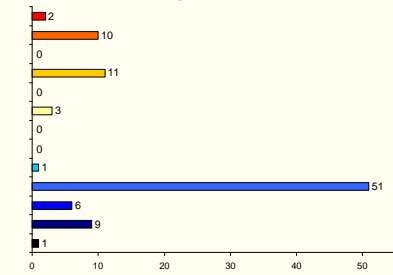
The following categories of information will be extracted:

- study characteristics
- characteristics of Intervention
- intervention Approaches
- sample size
- study outcomes

Frequency of Injuries Resulting in Emergency or Hospital Stay



Number of Studies Determined to be Relevant to the Systematic Review



Synthesis of Results

Information extracted from the review process will be entered into a matrix. Information will include:

- study design
- sport or recreation activity
- type of intervention
- outcome measures
- whether the intervention has been tested among children and youth
- setting of study
- quality of evidence

Following the synthesis of information, recommendations addressing implications for injury prevention programming and policy and areas for further research will be drafted.