

# **ATV Safety Best Practices Literature Review Summary**

June 10<sup>th</sup> 2016

## Project Overview

### Background

The purpose of the ATV Safety Best Practices literature review was to review published literature identifying promising practices for the provision of intervention services targeted toward reducing risk-taking behaviour in relation to ATV use among youth aged 13 to 17. This annotated bibliography has been created with the intention of informing future approaches to ATV safety within AHS. More specifically, it will be used to inform the direction of programming activities of the AHS ATV Safety Toolkit Working Group. Activities of this group are to identify and develop ATV safety tools that are evidence informed and adhere to the AHS Position on ATV Operation.

### Literature Review

#### Method:

The articles summarized in this bibliography were identified using a search of the following seven electronic databases of academic articles: Medline, EMBASE, ERIC, PsychInfo, PubMed and CINAHL. The articles searched were limited to those published in English between 2006 and 2016. Search terms included but were not limited to Youth, teen, adolescent, high school student; injury, accident, risk; motor vehicle, all-terrain vehicle, quad, off-road vehicle; risk management, safety, prevention, reduction, risk recognition; parent education, strategies, practice, intervention, program, campaign, pilot, resource, study, trial, evidence based. Twenty six (26) articles were selected for the process of critical appraisal.

#### The literature review included:

1. Youth between age 13 and 17
2. Parents or guardians of youth between age 13 and 17
3. Professionals working with youth between age 13 and 17
4. Strategies to manage teen risk taking (including risk recognition strategies) in relation to all-terrain vehicle use
5. Reviews from North American countries; Europe; Australia and New Zealand
6. Primary research, systematic reviews and meta-analyses
7. Literature written in the English language

#### The literature not included:

1. Children and teens younger than 13 or older than 17
2. Parents/guardians/professional of children and teens younger than 13 or older than 17
3. Does not address management of risk taking behaviour in relation to all-terrain vehicle use
4. Disease prevention or treatment focused (treatment of injury or disease itself)
5. Focuses on the efficacy of specific equipment or training skills
6. Theories, theoretical papers, or expert opinions
7. Literature written in another language than English

## Critical Review

1. One third of the literature was reviewed by two reviewers, blind to each other's selection
2. Reviewers rated the selected literature according to the quality of the design of the study using appraisal tools available to the youth injury prevention team, which were consistent with the standards of Public Health Innovation and Decision Support (PHIDS).

## Literature Summary

1. A total of 20 articles were selected.
2. A total of 2 were found to be of strong quality assessment.
3. A total of 18 were found to be of moderate quality assessment.

## Next Steps

1. Review the literature to determine the next steps of the AHS ATV Safety Toolkit Working Group
2. Identify existing practices that are consistent with the findings of the literature review
3. Develop tools that are consistent with the findings of the literature review as well as the AHS Position on ATV Operation.

The following is a summary of the literature review described above. This summary will provide an overview of three themes found in the selected literature and conclude with a discussion of the gaps and limitations of the review, and recommendations for next steps.

### *Themes*

#### *Media Campaigns*

The research demonstrates that media campaigns are a crucial component of effective ATV safety education. (Shah et al 2012; Vanlaar et al 2015; Unni, Morrow, Shultz 2012; Beaudin, Dunand, Piche, Rousseau, & St-Vil 2014). ATV safety materials used in media campaigns must address the content and design needs of the target population. In a qualitative study exploring factors that impact community engagement in ATV related media campaigns, Brann, et al (2012) found that youth and adult ATV riders prefer action-oriented safety messages that inform them about how to operate ATVs safely. These messages must be clear, realistic, visually appealing, and easily accessible. Furthermore, Vanlaar et al (2015) assert that public awareness campaigns must pay particular attention to issues of child (<16) injuries among OHV users. The authors state that the message that children younger than 16 lack the strength to safely control a large ORV, and therefore should be prohibited from ORV operation, must be clearly conveyed to the public.

After conducting a cross-sectional analysis of surveys distributed to youth, exploring ATV driving habits and crash history, Campbell et al (2010) conclude that risky ATV riding behaviours among children are common, current safety recommendations are largely ignored, and engaging in risky riding behaviours increases the risk of crash. The authors state that educational programs and media campaigns are necessary to increase positive attitudes toward safety recommendations and safe riding behaviours. These findings are corroborated by Shah et al (2012) who indicate that the safety recommendations of organizations like the ATV Safety Institute and guidelines regarding ATV ridership by children are not widely accepted and followed. They assert that engagement strategies such as public awareness campaigns and educational programming must be employed to better engage the ATV riding community and reduce ATV related injury.

A study by Beaudin et al (2014) examined ATV riding behaviours as well as injury and mortality rates before and after ATV legislation in Quebec. The study, found that ATV legislation alone was not sufficient to increase safety behaviours or reduce injury rates. Strategies such as public campaigns at multiple levels of community and government, combined with strong legislation with enforcement are recommended. Unni et al (2012) echoed this conclusion, stating that legislative approaches to ATV injury reduction may be ineffective due to a lack of rider awareness of both safe riding behaviours, and the consequences of risky riding behaviours. Moreover, ATV riders may be unaware of the ATV legislation in their jurisdiction. Multi-tiered public education campaigns that aim to raise awareness about regulations, policies and safety guidelines as well as risk management strategies to mitigate injury, are crucial.

### *Educational Programming*

A few papers in this review focused on evaluating existing ATV safety educational programs. These evaluations examined the impact of programs on knowledge, attitude and behaviours related to ATV operation. Williams et al (2011) evaluated an educational ATV safety video shown in a hunter education course. The results demonstrated that exposure to the video increased ATV safety knowledge, suggesting that hunter education programs, which are operated in most states, are optimal settings for community-based ATV safety education. The authors concluded that future research should focus on whether such education programs are also effective in increasing safety behavior and reducing injury. Jennissen et al (2015) evaluated the *STARs ATV Safety* educational program and found that exposure to the program increased short-term ATV safety knowledge. Almost half the participants reported they would use the safety information that they learned during the program. Another evaluation of an educational safety program found that the program was effective in increasing ATV safety knowledge for most participants but demonstrated limited effect on safe riding behaviours (Novak et al 2013).

While the findings above are promising, educational interventions alone are not sufficient in changing behaviour. Education must be included in broader, community-based, multi-agency interventions to effectively change the knowledge, attitudes and behaviours of youth who operate ATVs. Overall, the evaluation reports of educational programs suggest that while they are effective in increasing knowledge, a multi-tiered approach including education, media campaigns and legislation is required to increase safe ATV riding behaviours and reducing ATV related injury and fatality.

### *Community Involvement*

Several studies suggest that understanding the behaviour and social context of youth ATV operators plays a crucial role in directing ATV injury prevention initiatives (Burgus et al 2009; Grummon et al 2014; Lord, Tator & Wells 2010; Pelletier et al 2012). Many of these studies indicate that the presence of alcohol and a lack of helmet use are leading risk factors in ATV related injury and fatality. They conclude that not only should injury prevention programming focus on these risk factors, but that professionals must consult with communities to identify knowledge and attitudes toward alcohol and helmets. For example, a qualitative study of attitudes toward helmet use found that a lack of risk perception is an important barrier to helmet use among ATV riders. In other words, ATV operators do not think the activity is dangerous. Education about the dangers of ATVs, focusing on the risks of engaging in unsafe ATV behaviors, as well as the danger of the vehicles themselves, is necessary (Adams et al 2013). Finally, safe behaviour choices in relation to ATV operation must be made affordable, accessible and desirable. For instance, Davison et al (2012) found that

helmet provision programs in combination with educational campaigns increased the use of helmets during ATV operation compared with educational campaigns alone.

A review of safety educational programming and good practice outlines the principles discussed above. A total of 12 papers were included in the final review. No studies were found that assessed the impact of safety education on injury rates. Seven studies assessed the impact of safety education on knowledge, attitudes, behaviour and skills related to risk management. These studies demonstrated that safety education increases knowledge but does not necessarily alter risk taking behaviour. Several papers provided examples of best practice in the provision of safety education. These practices are: 1) using realistic settings, 2) using active approaches to learning, 3) involving children and youth in the development and delivery of programs and activities, and 4) working with multiple agencies in the development and delivery of safety education programs (Mulvaney et al 2011).

### *Limitations*

The main limitation of the ATV Safety Best Practices Literature Review is that while the objective was to identify the best practices in ATV related youth injury prevention programming, there was a limited number of articles that reported evaluation results of such programming. Mulvaney et al (2011) conducted a literature review examining the impact of safety education on knowledge, skill and behaviour of teenagers younger than 18; however, the articles included in this review were not limited to ATV Safety. Despite this, the literature provides sufficient information on the demographics and risk factors for ATV related injury and best practice in youth injury prevention initiatives. That information can and will be used to inform the direction of programming activities of the AHS ATV Safety Toolkit Working Group.

### *Conclusions and Recommendations:*

The ATV Safety Best Practices Literature Review identified three main themes. These themes are *media campaigns*, *educational programming* and *community involvement*. The findings suggest that media campaigns and educational programs are effective in increasing knowledge and skills related to the risks associated with ATV use, and safety behaviours that reduce these risks. The literature reiterates that children and youth younger than 16 should not operate ATVs as they are at particular risk for injury and death. Overall, the research suggests that a multi-tiered, collaborative effort involving government, community organizations and people in the communities that own and ride ATVs is required to reduce ATV related injury and fatality. To be most effective, the efforts must include government regulation, media campaigns and educational programming.

Based on the findings of this literature review, the ATV Safety Toolkit Working Group recommends the following:

- 1) Work with AHS Communications to re-launch the View Kids Can Get Campaign
- 2) Identify tools, activities and programs that are shown to be effective in increasing knowledge and skill and modify them to align with the AHS Position on ATV operation

- 3) Develop an ATV Safety Toolkit, including tools, activities, programs, campaign materials as well as information on position statements, policies and regulations related to ATV operation
- 4) Continue to participate in the advocacy of regulation on ATV operation in Alberta

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