



# An evaluation of the impact of 'Lifeskills' training on road safety, substance use and hospital attendance in adolescence



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## ABSTRACT

**Purpose:** To evaluate if attendance at Lifeskills, a safety education centre for children in Year 6 (10–11 years), is associated with engagement in safer behaviours, and with fewer accidents and injuries, in adolescence.

**Methods:** The sample are participants in the Avon Longitudinal Study of Parents and Children who attended school in the Lifeskills catchment area in Year 6; 60% attended Lifeskills. At 14–15 years, participants (n approximately 3000, varies by outcome) self-reported road safety behaviours and accidents, and perceived health effects and use of alcohol, cannabis, and tobacco. Additional outcomes from linkage to Hospital Episodes Statistics were available for a sub-sample (n = 1768): hospital admittance (for accident-related reason, from 11–16 years) and A&E attendance (for any reason, from approximately 14–16 years).

**Results:** Children who attended Lifeskills were more likely to report using pedestrian crossings on their way to school than children who did not attend (59% versus 52%). Lifeskills attendance was unrelated to the ownership of cycle helmets, or the use of cycle helmets, seat belts, or reflective/fluorescent clothing, or to A&E attendance. Use of cycle helmets (37%) and reflective/fluorescent clothing (<4%) on last cycle was low irrespective of Lifeskills attendance. Lifeskills attendance was associated with less reported smoking and cannabis use, but was generally unrelated to perceptions of the health impact of substance use.

**Conclusions:** Lifeskills attendance was associated with some safer behaviours in adolescence. The overall low use of cycle helmets and reflective/fluorescent clothing evidences the need for powerful promotion of some safer behaviours at Lifeskills and at follow-up in schools.

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## 1. Introduction

Adolescence is a developmental period during which many risk-taking behaviours emerge, increase and eventually peak (Boyer, 2006). The term risk-taking generally refers to behaviours associated with some probability of undesirable results, and can include poor road safety, substance use, and unsafe sexual activity (Boyer, 2006; Beyth-Marom and Fischhoff, 1997). Risky behaviours can be actions (e.g. drinking alcohol) or non-actions (e.g. not wearing a cycle helmet) (Beyth-Marom and Fischhoff, 1997). Unintentional injuries during adolescence are a major cause of morbidity, and the leading cause of mortality, both in England (Fauth and Ellis, 2010)

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and worldwide (Peden, 2008). Since unintentional injury is not only costly to individuals and their families but also to the state, prevention is a public health priority (Lyons et al., 2011; Public Health England, 2014; Royal Society for the Prevention of Accidents, 2013). Education has long been regarded as important in the prevention of injuries and substance use in children and young people. However, whilst there is some evidence that education increases safety knowledge, evidence of whether there are subsequent reductions in injuries or accidents is more limited (Fauth and Ellis, 2010).

The Lifeskills safety education centre in Bristol opened in 2000 and is one of seventeen permanent LASER (Learning About Safety by Experiencing Risk) projects in the UK (Lifeskills, 2015). It is built as a realistic village comprising a number of 'sets' including a road, houses, river, and railway line (Table A.1 summarises learning objectives by set). Typically, children visit the centre in whole class groups and during each school's 2-h visit, trained adult Volunteer Guides take pupils around the sets of the village in small groups of

3–4 pupils. The children work through interactive, safety-related activities with their Guide, and are given the opportunity for discussion. This interactive and experiential approach is viewed as good practice (Mcwhirter and Francis, 2012; Tolmie et al., 2005).

To achieve accident avoidance or engage in safe behaviours, risk needs to be recognised and knowledge of appropriate behaviours needs to be acquired, retained and put into action. Safety education interventions need to be evaluated from all these points of view (House of Lords Science and Technology Select Committee, 2011). An early evaluation of Lifeskills assessed knowledge pre-intervention and at three time points post-intervention to distinguish between immediate learning and longer-term retention. Good acquisition and retention was shown in many but not all domains (Lamb et al., 2006; Cowburn et al., 2003). However, the early evaluation did not investigate whether Lifeskills training was associated with engagement in safer behaviours, or a reduction in accidents and injury, over time.

The current research uses data from ALSPAC, a longitudinal study based in the same geographic area as Lifeskills, to evaluate the long-term effectiveness of some aspects of the Lifeskills training by comparing outcomes for children who did and did not attend. This evaluation focuses on outcome measures where achievement of the Lifeskills learning objectives would be expected to influence the outcome. These measures were chosen a priori by the study team and related to road safety, perceptions and use of substances (alcohol, tobacco, cannabis), and hospital attendance.

## 2. Methods

### 2.1. Sample

Subjects were participants in the Avon Longitudinal Study of Parents and Children (ALSPAC). Details of the ALSPAC study have been published (Boyd et al., 2013) and a searchable data dictionary is available ([www.bristol.ac.uk/alspac/](http://www.bristol.ac.uk/alspac/)). ALSPAC recruited pregnant women with expected delivery dates between April 1, 1991 and December 31, 1992 who lived in a defined geographic area (Avon, UK). There were 14,062 live births and 13,988 children alive at one year. The children have been studied throughout their lives using maternal and self-report questionnaires, and clinic visits. Singleton children who were registered at a state-maintained school in the Lifeskills catchment area in Year 6 (as recorded in the National Pupil Database [NPD]) were eligible for inclusion in the current study ( $n = 10,112$ ) (Fig. A.1). Ethical approval for ALSPAC was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees.

### 2.2. Measures

#### 2.2.1. Exposure – lifeskills attendance

Schools in the Lifeskills catchment area (counties of Bath and North East Somerset, Bristol City, North Somerset, and South Gloucestershire) are eligible to book a visit for their Year 6 pupils, and each year there is the capacity for around 65% of schools to attend. Lifeskills provided an attendance register of schools that had visited during the academic years that the ALSPAC participants were in Year 6 (2001/2002, 2002/2003, and 2003/2004). The NPD Year 6 school registration details of the ALSPAC participants were linked to the Lifeskills school attendance register. Where a link was established, the child was classified as having attended Lifeskills; where no link was established, the child was classified as not having attended Lifeskills.

#### 2.2.2. Outcomes

**2.2.2.1. Road safety.** The road safety related items were included in postal questionnaires sent to participants at age 14 years: own

a cycle helmet (no, yes); wore a cycle helmet last time you rode a bike (no/can't remember, yes); wore reflective/fluorescent clothing last time you rode a bike (no/can't remember, yes); use of pedestrian crossings on the way to school (always/most times if available, sometimes/hardly ever/never); used a seat belt last time you travelled in a car (no/can't remember, yes); always wear a seatbelt when in car (no, yes); involvement in a road traffic accident (RTA) in the past year as a pedestrian or cyclist (no, yes).

**2.2.2.2. Substance perceptions and use.** Perception of the impact of alcohol [regular (daily) and binge drinking], regular smoking of cigarettes, and regular cannabis use, on physical and mental health were reported via a postal questionnaire sent at age 14 years. Answer options were on a 5-point scale from 'very harmful' to 'very helpful'. A binary outcome was derived for each outcome (very harmful or not) as the vast majority reported each substance was harmful or very harmful.

Substance use was reported at age 15.5 years during a computer session administered at the ALSPAC clinic. The binary (no/yes) substance use variables were: frequent drinking (20 or more occasions in past 6 months); regular binge drinking (5+ drinks in any 24-h period in previous 2 years on 20+ occasions); behavioural problems due to alcohol (any of: used alcohol in dangerous situations; been accidentally physically hurt whilst drinking; had problem with police; got into fights because of drinking); recent smoking (any in past 30 days); current weekly smoking; occasional cannabis use (used more than once); problematic cannabis use (reported fairly often/very often to one or more of the 6 questions from the Cannabis Abuse Screening Test (Piontek et al., 2008)).

**2.2.2.3. Hospital attendance.** A sub-sample of the ALSPAC cohort has been linked to the Hospital Episodes Statistics (HES) dataset compiled by the NHS Health and Social Care Information Centre (© 2012, re-used with the permission of The Health and Social Care Information Centre, all rights reserved.) This sub-sample is restricted to ALSPAC participants who, via a postal consent campaign conducted from 2011 to 2013, explicitly consented to the extraction and use of their NHS health records by ALSPAC. Of the 10,112 children who attended school in the Lifeskills catchment area in Year 6, 9284 were sent a consent pack requesting permission to link to their health records. Of these 24.6% (2282/9284) provided consent by December 18, 2012 (the last date on which HES records were extracted by ALSPAC). HES records were identified and extracted for 99.2% (2263/2282) of this sub-sample, of which 1762 had complete confounder data. The HES extracts include records of all hospital admissions and all A&E attendance episodes. For the hospital admittance outcome, admissions for reasons relevant to Lifeskills were identified using ICD-10 codes (V1-V49 road traffic accident related; F10-F19 alcohol, tobacco, drug related; T20-T30 burns and corrosions; W61-W74 drowning and submersions; T54.4, W85/W86 electrical accident) (World Health Organization, 2010). The binary outcome (no, yes) was hospital admittance for any of these reasons from the August of the year the child finished Year 6 until the August of the year they finished Year 11 (approximately age 11–16 years).

For A&E visits, the binary outcome (no, yes) was any A&E attendance from April 2007 (data only available from this date) until the August of the year the child completed Year 11. Therefore, for the oldest year group, the A&E data covers a 5 month period from April to August 2007; for the middle year group, a 17 month period from April 2007 to August 2008; and for the youngest year group, 29 months from April 2007 to August 2009.

#### 2.2.3. Potential confounders

Measures of socioeconomic position (SEP) were reported by the mother during pregnancy: highest maternal education

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