A process evaluation of an injury prevention school-based programme for adolescents

L. Buckley* and M. Sheehan

Abstract

A process evaluation provides critical information that can inform the design and implementation of a programme. This study sought to provide examples of how to operationalize a process evaluation of an effective programme (Skills for Preventing Injury in Youth). A comprehensive definition of process evaluation was used which included assessing dose, adherence, quality of process, participant responsiveness and programme differentiation. Dose was assessed through teacher and student ratings as well as independent observations. Reports from an observer were used to assess adherence to programme objectives, the quality of process including interactive delivery and programme differentiation. Participant responsiveness was assessed quantitatively and qualitatively with students providing greater depth to the findings. Findings regarding dose varied and suggested different sources of reports provided supplementary information. The findings also suggested that independent observations are an important tool for process evaluation and identified challenges for programme designers regarding interactive material. Overall, the research indicated that a comprehensive definition of process evaluation could be operationalized and provided an understanding of an application of a process evaluation to an injury prevention programme. Continued development of process evaluations will enable a better understanding of the conduct of interventions and maximize the likely effect of such interventions.

Introduction

Well-designed curriculum programmes have been shown to prevent and reduce risk taking and injury among adolescents [1–3]. Programme researchers are in consensus that in the evaluation of such programmes a process evaluation is required [4] to describe and identify how well a programme has been implemented in comparison with the stated design [5, 6]. This paper reports on the methods and findings of a process evaluation of a school-based injury prevention programme, Skills for Preventing Injury in Youth (SPIY).

There are a number of different ways to comprehensively assess process evaluation. For example, Baranowski and Stables [7] suggested a highly comprehensive definition of a process evaluation, including understanding, recruitment and maintenance, implementation barriers and processes, resources available, the reach and use of materials, context of effective programmes and the effect of contamination. Dane and Schneider [8] propose a parsimonious and broad definition of process evaluation which was explored by Dusenbury et al. [5]. The definition appears highly applicable to the implementation of a programme in the classroom setting. It does not explore recruitment and selection issues but includes five key variables: (i) sufficient exposure to the programme (dose),
(ii) participant exposure to the programme according to stated objectives (adherence), (iii) quality of process or delivery, (iv) participant responsiveness and (v) essential elements to the programme are received by the intervention group and not the control group (programme differentiation). The process evaluation reported in this study used the conceptualization of Dusenbury et al. [5].

Dose and adherence

Dose and adherence are among the most widely reported elements of a process evaluation. Dose refers to the amount of material received [8]. Assessing adherence involves an evaluation of the content of the material which is delivered [6]. Typically programmes include essential and non-essential content areas with the essential elements often articulated in a set of objectives [9]. Dusenbury et al. [5] suggest that an assessment of adherence to objectives might provide a useful point at which to address adherence.

Botvin et al. [10, 11] assessed adherence and dose of the Life Skills Training programme through the use of observer raters. They rated the proportion of curriculum objectives achieved during a class session (i.e. adherence) as well as whether the curriculum material was delivered during the observed session (i.e. dose). In contrast, student self-report ratings also have been used in an assessment of dose, for example students report whether drug abuse was discussed in a session [12]. Harnett and Dadds [13] used teacher self-report surveys as a measure of dose. Teachers rated the main points that were covered and the extent to which they deviated from the manual. Dusenbury et al.[5], however, questioned whether the use of teacher data created a potential for bias. They suggested that teachers might have difficulty in accurately rating delivery if they felt pressure to report presenting material as instructed. This suggests a rationale for collecting multiple sources of data to assess adherence and dose. An observer might provide additional valuable information over and above teacher ratings about the delivery of curriculum [14].

Quality of process

Most commonly the assessment of the process in which the programme is delivered is conducted through observer ratings [15], although teacher reports have also been used [16]. Typically the process that is assessed relates to interactive processes that might include class discussions, role plays, small group work, practice and modelling. The degree to which teachers implement a programme as interactive can be critical to the behavioural outcomes of an intervention [17–19]. Dusenbury et al. [5] suggest that the interactive elements are important to assess in particular the quality of the interaction and the delivery of interactive material. They represent the elements of a programme most likely to affect change [20]. An interactive programme is one which includes material that promotes students active construction of knowledge for themselves [6]. The process has additional benefits in that it is more likely to be fun, and students are more likely to value and identify with the programme [18]. Tobler and Stratton [20] comprehensively reviewed drug and alcohol prevention programmes and found that the underlying factor common to effective programmes was interactive delivery methods. Although not always assessed, the degree to which programme implementation includes quality of process provides valuable information on whether a programme is interactive and appears to typically be assessed using observer ratings.

Participant responsiveness and programme differentiation

Participants’ perceptions of a programme are more commonly assessed as part of programme evaluation, for example whether the programme was liked or disliked and whether it was interesting, enjoyable or helpful [15]. Participant responsiveness can be viewed as the way in which participants are engaged by the programme [5]. However, a component analysis of material received by the intervention and control group is rare [5]. Sanchez et al. [15] adapted the definition of programme differentiation proposed by Dane and Schneider [8] to refer more
strictly to a component analysis of the intervention group experience rather than include an evaluation of any material received by a comparison group. They used observers to assess whether particular components were implemented in the intervention group.

Summary
A comprehensive approach to evaluating implementation of an adolescent behaviour change programme is rare particularly with regard to incorporating methodology with minimal impact on teacher workload [5]. The purpose of this study was to examine ways in which to assess the classroom implementation involving minimal extra commitment from teacher facilitators. The evaluation used both qualitative and quantitative methodologies including teacher reports, student reports and observer ratings. The study included an assessment of dose, adherence, quality of process, participant responsiveness and programme differentiation. The study used the SPIY programme, an injury prevention programme designed to reduce adolescent engagement in risk-taking behaviour by teaching and supporting skills. The outcome evaluation of behaviour change indicated that the intervention was effective in reducing risk-taking behaviour [21].

Methods
Overview of SPIY
SPIY aimed to reduce adolescent risk taking and associated injury. It sought to do so by reducing their involvement in risk taking, increasing their protective behaviour towards friends and improving injury management skills. The programme was implemented into the curriculum of Year 9 Health classes such that no additional time was needed for the programme and it was delivered by classroom teachers. The programme was trialled in a lower socio-economic region of South-east Queensland, Australia. In Queensland, most students turn 14 years of age during Year 9. Two schools were involved in the trial, one school with ~250 Year 9 students and the other ~100 Year 9s.

Students received one lesson per week (of ~50 min) over an 8-week school term. Each lesson involved the presentation of a brief scenario of risk taking and injury to contextualize the activities in the lesson. The scenarios were drawn from an amalgamation of reported stories of local risk taking and injury situations obtained in earlier research [22]. For example, to contextualize material related to treating burns and examine possible protective behaviours, a story was first presented whereby a group of friends were taking risks riding a motorcycle off-road. One of the friends went too fast and fell off the motorcycle as a consequence he burnt his leg on the exhaust pipe. First aid material was taught to highlight and personalize the severity of injury consequences and the serious nature of risk taking. The first aid material directly related to the injury experience in the scenario.

Finally, cognitive–behavioural processes were used to develop skills in protecting friends and reducing risk taking. The activities were operationalized using the theory of planned behaviour [23] and were directly linked to the risk-taking behaviour portrayed in the scenario. A theory-based design was included as it has been suggested that they provide logic, internal consistency and structure [24]. According to Fagan and Mihalic [25], programme implementers (such as teachers) who see an intervention as logical are more likely to adhere to instructions and follow programme directions. In one example, activity operationalized with regard to perceived behaviour control (just one construct of the theory), students were given the opportunity to role play and problem solve different solutions to helping a friend. Perceived behavioural control is said to involve the perception that one has control in performing a behaviour [23]. Students developed skills by practising, modelling and having modelled for them different behaviours designed to encourage their feeling of control in performing the behaviour, in this case helping the friend manage interpersonal violence.

Both the first aid and risk-taking/protection components involved many interactive activities. In order to develop the programme, considerable consultation work was undertaken with the community.
This work included focus groups with high-risk students to understand injury and risk taking and a mapping exercise of resources with the previous cohort of the intervention schools’ Year 9 and senior students. Also a two-stage process of interviews with teachers was conducted. The first stage included a large-scale workshop of teachers across the region and a second with teachers at the intervention schools to determine how the programme might fit within their school and the content areas that they thought were suitable.

All intervention teachers took part in a full day training session to discuss the content and processes of the material and the aims and objectives of the material and approaches. Training was designed to encourage interactive discussion regarding classroom style and the importance of active student participation. A separate training day was held for each school with the same facilitator and co-facilitator. Follow-up telephone conversations were made twice through the term with the facilitator to discuss any issues. Detailed lesson plans were provided to teachers and a student workbook was also provided to support the activities in the curriculum.

**Participants and procedures**

**Students**

A total of 310 intervention students completed a baseline questionnaire and a total of 270 students (87%) completed a follow-up questionnaire at immediate post-test. The mean age of the students was 13.7 years old (SD = 0.5) at the follow-up time. All students in Year 9 at the two intervention schools participated in the programme. The self-report questionnaire was administered in approximately one class lesson of 45 min at pre- and post-intervention time points.

A sub-sample of 70 students \( n = 32 \) males were involved in follow-up evaluation focus group discussions. Saturation in the qualitative data was reached with the sub-sample and no further focus groups were conducted. Morgan [26] suggests that saturation is reached when additional data do not bring about additional understanding. There were approximately six to nine students in the 10 focus groups chosen from three randomly selected classes. Focus groups were audio recorded by the facilitators (psychology graduates). Additional follow-on questions were used to enable clarification and enhancement of responses in a semi-structured format.

**Teachers**

Nine of the 12 teachers who facilitated the programme completed a brief questionnaire. Once completed, brief semi-structured discussions took place with two facilitators and were \( \sim 20 \) min in duration. Prompts were used to elicit details (with prompts such as, ‘Overall, what did you like best about the SPIY program and Why?; What did you NOT like about the SPIY program—what needs to be improved and Why?; Would you say time was the major factor in not completing the lessons or were other factors important?; Which sections did you tend to skip over?’). The remaining three teachers were unavailable at the time of data collection. Teacher discussion and questionnaire administration involved one group of six teachers, a group of two teachers and an individual teacher interview. No details were collected from teachers about demographics except that there were seven males. Health teachers at Queensland high schools have first aid knowledge and basic injury prevention knowledge. They do not necessarily have current first aid certification and teachers typically do not have previous training or experience in delivering cognitive behavioural strategies. This was the case with the teachers in this study.

**Observer rating**

A single trained observer attended approximately three randomly selected lessons per week (15–20% of all lessons). She was asked not to contribute to classes. The observer received training in the programme (3 hours in duration) separate to the teachers and was a schoolteacher familiar with interactive delivery methods. The observer had a detailed checklist beside the overview of activity descriptions. She was to rate time spent on task, degree of completion (scale 1–10), if and how the activities were altered, student attention and
understanding (scaled 1–10), as well as any other comments.

**Measures and data analysis**

Table I shows the data analysis for each component of process evaluation and the measures used.

**Adherence**

Observer ratings were used to measure adherence to programme objectives. The observer rated whether the objective of an activity was met and a sum total of objectives met was created.

**Dose**

Three measures of dose were used. Dose was assessed by summing the number of activities that students self-reported they remembered at the end of the intervention. Students were asked to respond ‘yes’ or ‘no’ to whether they remembered or learnt something from key activities in the lesson, such as ‘burns’ treatment or a lesson with a ‘motorbike’ scenario. Typically, there were two activities per lesson that were provided as prompts. Teachers’ self-reported material also covered as an assessment of dose using a four-point Likert-type scale, from ‘not covered at all’ to ‘covered in full’ as a measure of dose. With regard to reasons for lack of coverage, they were prompted with either ‘yes’ or ‘no’ to several identified potential issues (for example, behavioural problems and inappropriate literacy level). The observer also rated time spent on the each activity as a measure of dose. A total percentage of dose was calculated from the observer rating.

**Quality of process**

Quality of process similarly was assessed using observation data, in this case of observations of interactive processes. Qualitative teacher data were supplementary to assess self-reported reasons for inclusion or exclusion of interactive process.

**Participant responsiveness**

Participant responsiveness was examined through student self-report and focus group data. Students

<table>
<thead>
<tr>
<th>Table I. Data analysis overview</th>
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<tbody>
<tr>
<td>Fidelity type</td>
<td>Data source</td>
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<tr>
<td>-------------------------------</td>
<td>---------------------------------</td>
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<tr>
<td>Dose</td>
<td>Student</td>
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<td></td>
<td>Teacher</td>
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<tr>
<td></td>
<td>Observer</td>
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<tr>
<td>Adherence</td>
<td>Observer</td>
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<td>Quality of Process</td>
<td>Observer</td>
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<td></td>
<td>Teacher</td>
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<tr>
<td>Participant</td>
<td>Student</td>
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<tr>
<td>responsiveness</td>
<td>Observer</td>
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<tr>
<td>Programme differentiation</td>
<td>Observer</td>
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</table>

\(^a\)If students remembered either activity in the lesson, it was recorded that they remembered the lesson.
were asked to rate on a 10-point Likert-type scale (1 = not at all and 10 = a great deal) whether they felt the programme was ‘interesting’, ‘informative’ or ‘boring’ and whether they perceived behaviour change. Some example prompts from focus group discussions included ‘What did you learn last term?’ and ‘Do you think you changed your risk-taking behaviour?’

**Programme differentiation**

Programme differentiation was examined from observer ratings of the content areas that were delivered as outlined. An overall percentage was calculated for the two key content areas important to the programme; peer protection and first aid.

**Linking dose, participant responsiveness and outcomes**

Chi-squared or analyses of covariance (ANCOVAs) were conducted to assess associations between dose and participant responsiveness and outcome. Below is a description of the outcome measures.

**Outcomes measures**

*Unique identifier questions* To enable the matching of individual anonymous student questionnaires across time, students were asked to report their mother’s first name, the date and month of their birth and the first initial of their first name.

*Adolescent injury checklist* The adolescent injury checklist (AIC) was used to assess the number of self-reported injury types (e.g. burns and sprains) that occurred in the 3 months prior to the survey. The AIC was originally adapted by Jelalian et al. [27]. Student reports of an injury were coded as ‘yes’ if they reported any number of the injury occurring. The ‘yes’ responses to each of the six types of injuries were then summed to produce a total score.

*Peer protection* Intention to protect a friend was measured by the peer influence survey [28]. Students responded to 11 risk-taking behaviours of their friends whether they would ‘report them’ or ‘try and stop them’ (protective behaviour) or ‘join in’, ‘do nothing’ or ‘walk away’ (not protect). Acknowledgement of protective behaviours was summed to produce a total score. Three factors were produced for this measure but for the study reported here only protection of common risk taking was used (five items, Chronbach’s alpha = 0.72).

*First aid knowledge* A measure of first aid knowledge was adapted for adolescents [29]. Each of six items of an injury situation had four possible responses. Students were asked to identify the correct first aid response. A total score was created of correct responses. This measure was included at follow-up only.

**Results**

There were five elements of process design that were examined in this study each with unique findings that are presented in this section.

**Dose**

*Student ratings*

The mean number of lessons remembered by students was 7.5 of a maximum of eight lessons (SD = 0.8, range 0–8). More than half of students remembered all eight lessons (62.8%) and 85% of students remembered seven or more lessons.

*Teacher rating*

According to teachers, most activities were covered mostly or in full (see Table II). For each activity, there were approximately four teachers who reported ‘mostly’ covering material and two who covered ‘all’ material. There were no reports of any failure to complete material. Teacher reports of the reasons for not implementing particular activities are presented in Table III. Teachers reported that the most common reason for failing to implement an activity was class disruptions and too much material for lesson times (55.6% indicated ‘yes’) whereas no teachers felt that it was because the programme material was unclear.

*Observer rating*

The mean percentage of total activities taught was 67% (range 38–88%). Two lessons had a mean less than two-thirds, Lesson 2 (mean = 55%) and Lesson 8 (mean = 39%).

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Adherence

There were typically two lesson objectives per lesson. The overall mean of adherence to lesson objectives was 78% (SD = 21.3) of objectives across the programme.

Quality of process

The observer rated the amount of interactive material that was delivered. The mean percentage of material per lesson that was intended to be interactive and was delivered as such was 49% (range for any activity, 0–100%).

A common theme in the discussions with teachers was reports that student behavioural issues made implementing discussions and interactive processes (e.g., role play) more challenging. This was reported by six teachers at some point in the discussion. Several teachers reported a challenge of covering material in the allotted time (five of the nine teachers, see Table III). Behavioural disruptions reportedly reduced time available for interactive processes. For example, one teacher noted, ‘I just found all the questions and things sometimes took me a little too long because they were just a nightmare … maybe have a backup worksheet’. Other teachers noted that discussions were generally more difficult, for example, ‘it was just harder to get them motivated for the discussion parts’.

Participant responsiveness

Students generally responded favourably to the programme. Students were asked to report in the focus group discussion how they felt they had changed on the skills of helping a friend who was injured, stopping a friend doing something risky and reducing their own risk-taking behaviour. The themes and content regarding each of these new skills along with example quotes are summarized in Table IV. Concepts were identified as part of themes if they were expressed with frequency, extensiveness or intensity [30]. Generally speaking with regard to first aid, students identified new knowledge and reasons it was remembered, for example, ‘We learnt what DRABCD means’ (male) and ‘I reckon that we learnt better when we practiced things’ (female). With regard to their decrease in risk taking, a general theme of how to avoid and identify risks was noted along with the influence of peer pressure, for example, ‘you know what will happen (now)’ (male 1) with a second male following with, ‘yeah, like for example, like how they said like if like someone goes to tell you, if your mate tells you to come for a drive, even though he doesn’t have his license, and you say no because you know what can happen, or what the consequences are’. Skills in protecting friends were reportedly influenced by the context, for example. Students were able to identify a number of protective skills, for example, ‘you can give them reasons not to do

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<th>Table II. Amount of material covered for each prevention activity by number of teachers</th>
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<tr>
<td>Activity</td>
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<tr>
<td>Brainstorming</td>
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<tr>
<td>Considering sources of support</td>
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<tr>
<td>Discussion on mates/challenging norms</td>
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<tr>
<td>Role play</td>
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<tr>
<td>Considering cognitions</td>
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<tr>
<td>Challenging cognitions</td>
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<tr>
<td>Problem solving</td>
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<tr>
<td>Mean (SD)</td>
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There were no reports that material was not covered at all. There was no missing data (n = 9); SD, standard deviation.

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<tr>
<th>Table III. Number of responses indicating support for various explanations for not implementing activities</th>
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<td>Reason</td>
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<td></td>
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<td>Too much in time frame</td>
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<tr>
<td>Unclear manual</td>
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<tr>
<td>Sections unimportant/irrelevant</td>
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<tr>
<td>Class disruptions</td>
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<tr>
<td>Higher literacy required of students</td>
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<tr>
<td>Not appropriate for other reasons</td>
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</table>

There was no missing data (n = 9).
it, because like there was stuff in there like saying about your thoughts and their thoughts and their thoughts before and their thoughts after and you can sort of say well, ‘’you’ll be like this if you do this’’ (female).

**Programme differentiation**

The median percentage of all first aid material covered was 66% (range = 0–100%) and for the protection/ risk reduction material was 70% (range = 0–100%).

### Linking dose, participant responsiveness and outcomes

The links between student-reported dose and outcome variables were assessed. Table V shows the associations between student recollections of some activities (grouped into low, medium and high recollection) with outcome. Students who remembered more lessons had greater first aid knowledge at follow-up \[F(2, 197) = 6.623, P < 0.01\]. For those that remembered more lessons, there was a trend towards greater change towards more positive intention for

<table>
<thead>
<tr>
<th>Themes, concepts and example quotes of behaviours</th>
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<tr>
<td><strong>Themes</strong></td>
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<tr>
<td>First aid</td>
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<td></td>
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<tr>
<td>Reduce risk-taking behaviour</td>
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<td>Protecting friends: post-injury</td>
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<td>Protecting friends: preventing injury</td>
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<tr>
<th>Table V. Change in injury and peer protective behaviour of common risks and first knowledge at Time 2 according to amount of lesson remembered</th>
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<td><strong>Outcome variable</strong></td>
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<tr>
<td>Change in injury*</td>
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<tr>
<td>Positive change in peer protective behaviour*</td>
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<tr>
<td>First aid knowledge**</td>
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</table>

M, Mean response.

*Negative change = reduced number of injury types over time. Standard deviation reported in brackets. *P < 0.10, **P < 0.01.
peer protection \[\chi^2 (2, 110) = 5.738, P = 0.06\]. A chi-squared test was used to assess change in peer protection as the analysis of variance violated the Levene’s test of equivalence of error variance. Categories of positive and negative change were used instead. For change in injuries at post-intervention, there was no significant difference between those of high, medium or low dose \[F(2, 145) = 0.856, P = 0.43\]. Sex was a non-significant co-variate in the ANCOVA analyses.

Student reports of dose were also linked with the examination of participant responsiveness (see Table VI). Those students who reported doing more of the programme generally found it interesting and enjoyable but not boring.

An examination was also undertaken of any link between participant responsiveness and outcome. The participant responsiveness variables (i.e. the programme being interesting, enjoyable or boring) were not significantly associated with change in outcome or key components of the programme (i.e. risk taking and intention to protect friends). The case of the first aid knowledge component was an exception. It was significantly associated with reporting that the programme was informative \[F(9, 216) = 3.326, P < 0.01\].

## Discussion

An effective process evaluation provides valuable information regarding the future design and implementation of programmes [31]. A comprehensive definition as set out by Dusenbury et al. [5] was applied. The assessment covered content and process implementation (including dose, adherence and quality of process) as well as responsiveness and differentiation. SPIY was generally implemented as intended. The findings also provide a useful extension of previous research (for example by Sanchez et al. [15]) in demonstrating ways in which to operationalize a comprehensive process evaluation. The process evaluation findings were further used to rewrite the next version of SPIY.

### Dose and adherence

With regard to dose, teachers generally felt that they implemented most or all the material and students reported that they remembered most of the lessons. Observer ratings, however, differed and indicated that closer to two-thirds of the activities were delivered as outlined. Programme evaluators have sometimes raised questions about the use of teacher self-report data as a sole data source in assessing dose [32]. This might reflect the contention that self-report data from students and teachers are more susceptible to social desirability than observational data [8, 13]. It may be that teachers believe they are addressing objectives with their inclusion of new material. The observer ratings in the present study did indicate that 78% of the objectives were met. Such a figure more closely reflects teacher ratings regarding the amount of content delivered. The current study highlighted difference among data sources of dose, suggesting that data collected from teachers should be supplemented, particularly by the use of independent observation [31–33].

Teacher reports in this study still provided rich information about the factors that affected dose, for example managing behavioural issues and the quantity of information that can be included within

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### Table VI. The mean (M) and standard deviations (SD) for students' feelings about the programme and percentage of student responses regarding attitudes about the SPIY programme

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>Mean (SD) Low dose</th>
<th>Medium dose</th>
<th>High dose</th>
<th>Significance testing</th>
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<tbody>
<tr>
<td>Programme was informative</td>
<td>6.44 (2.4) (n = 305)</td>
<td>M = 5.5 (2.1)</td>
<td>M = 7.3 (1.9)</td>
<td>M = 6.9 (2.5)</td>
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<tr>
<td>Programme was interesting</td>
<td>6.25 (2.4) (n = 307)</td>
<td>M = 5.6 (2.1)</td>
<td>M = 6.7 (2.2)</td>
<td>M = 6.9 (2.5)</td>
</tr>
<tr>
<td>Programme was boring</td>
<td>4.88 (2.7) (n = 304)</td>
<td>M = 5.4 (2.6)</td>
<td>M = 4.7 (2.5)</td>
<td>M = 3.9 (2.3)</td>
</tr>
</tbody>
</table>

Range 1–10. The higher scores represented a greater endorsement of that variable. *P < 0.01, **P < 0.001.
the time frame of a lesson. The detail regarding factors that affect dose provided information for future programme design. The data highlight teachers’ perceptions of valued material and the material that they were willing to implement and will be used to update SPIY. The concerns that affected teachers’ implementation were similar to that of Melde et al. [31] who found ‘running out of time’ the most common reasons teachers reported for altering their programme. The inclusion of teacher reports, in addition to observer ratings, thus provides an understanding of ways in which to continue to improve a programme, for example by better considering the time frame of essential activities.

Quality of process

In terms of quality of process design, interactive components were delivered roughly half of the time. While this is a little disappointing, this type of data provides further information that highlights the continued need to develop and evaluate ways in which to increase the likelihood that teachers will facilitate interactive processes [25]. The additional qualitative information is valuable in highlighting the need for training sessions and support for teachers in facilitating interactive material while managing behavioural issues. The value of support and training will accordingly be further developed for SPIY.

The tendency for teachers to alter interactive processes is consistent with findings from other programme evaluations [31, 32]. The qualitative data from this study suggested that teachers not only appeared to recognize the importance of interactive delivery but also indicated that they were less inclined to facilitate such process. Many researchers emphasize the importance of training and skill development [8, 34, 35] or alternatively suggest improvements to programme design [6]. The inclusion of activities that are of shorter duration, well structured and in which teachers are well trained to deliver may improve teacher confidence and the likelihood that they will deliver the interactive material. In light of such findings, future iterations of SPIY will consider how activities might be shorter and more structured. One of the great challenges in curriculum programme implementation is how best to facilitate teacher implementation of interactive curriculum [36]. That is, in developing activities that optimize student learning and at the same time are likely to be delivered by teachers.

Participant responsiveness

The programme was generally reviewed favourably by students and this was evident from the quantitative and qualitative data. The focus group data provided reasons that students felt the programme might have been informative or beneficial, that is they found interactive processes were beneficial. Students also reported that their behaviour changed as a result of the programme and were able to give examples of content they found helpful. A qualitative assessment of students’ responsiveness complements the quantitative such that more specific details could provide information that can be used to further develop the programme. The material thought to be beneficial and useful by students will thus continue to be included in SPIY.

Programme differentiation

Information regarding the facilitation of different aspects of the programme indicated that both the first aid component and peer protection components were implemented similarly. The programme differentiation data suggest that both aspects were considered important by teachers. The information provides an indication that the combination of approaches was delivered and that teachers were able to facilitate both components. This was particularly important for the SPIY intervention given that teachers had familiarity with first aid but were unfamiliar with cognitive–behavioural strategies for facilitating peer protection and risk reduction. Such information supports the inclusion of both strategies in further revisions of SPIY.

Linking dose, participant responsiveness and outcome

Somewhat consistent with the findings regarding the implementation of other adolescent behaviour
change programmes is that some outcome variables were related to dose [10]. In this study, a relationship with dose was found with the variables that were theorized to reduce injury (first aid and peer protection) yet not with change in outcome (injury). It is, however, possible that these mediating variables are most affected in the short term. The relationship of dose to student outcome illustrates the value of its measurement with regard to analyses in outcome evaluations. In particular, it raises the question as to whether there should be separate analyses for various dosage levels or whether there is an appropriate dose for inclusion in outcome evaluation [31].

Particularly interesting in the context of the link between dose and participant responsiveness is that those who found the programme more interesting and informative were more likely to have remembered the class. While the directionality of the relationship is unknown, it does suggest that there is potential value in ensuring that a programme is of interest to students. Interesting programmes can facilitate attendance [18] and this increase in exposure links with a potential increase in the likelihood of change in outcome.

Limitations and recommendations for the future

Despite the value in the process evaluation, there are a number of limitations that must still be considered. A single observer assessed only a selection of teachers delivering each lesson. We did not validate her analyses; however, she underwent training and used a detailed checklist for the assessment. Further, an observer present in the classroom has the potential for teachers and students to alter their behaviour. An alternative of video recording classes, however, has ethical and privacy challenges.

The limited number of sessions in a small sample of schools restricts generalizability of findings; however, it does highlight the potential of observer ratings as a useful methodology to assess implementation. Future studies would also be strengthened if all aspects of the implementation evaluation could be linked with each other and with outcome variables. In this study, issues of confidentiality prevented identification of students by class and therefore the ability of student data to be linked to teacher reports and observations.

The current study only addresses a process evaluation with regard to classroom implementation; it does not evaluate the process of recruiting schools and therefore teachers and students. The SPIY evaluation presented included a small number of schools and all teachers and students at those schools were mandated to participate as part of normal classroom activities as approved by the school principal. One of the design features of SPIY was its explicit link to existing curriculum aims and mandates as specified by the state education authority. SPIY was able to be assessed using the process evaluation outlined by Dusenbury et al. [5]; however, another feature of SPIY was structured lessons and activities. This was designed, in part, to facilitate consistency across classrooms and minimize the work required of teachers. An important element of process evaluation research would be to examine similar methodology to that used in this study for a wide range of school-based programmes. Students at this age are mandated to attend high school, including the health class in which the programme was implemented, as such details of maintenance were not assessed. Such processes emphasize the degree of commitment needed at the school administration level to ensure programme implementation.

Conclusions

The data collected provide valuable information regarding programme design and implementation and in particular ways in which to conduct a process evaluation. The current study adds to the body of research by demonstrating how a parsimonious and comprehensive conceptualization of a process evaluation can be applied. Research on implementation is considered necessary; however, a thorough definition, such as that by Dusenbury et al. [15] is not always applied. The SPIY programme demonstrated a solid degree of implementation across dose, adherence to objectives, participant responsiveness,
quality of interactive processes and implementation of the two key components.

The information was also able to be used to continue to refine and modify the programme for future implementations of the programme. This includes taking on board the findings from each section of the process evaluation. With regard to dose and adherence, greater consideration will be made for the timing of activities and the way in which timings are communicated to teachers (in both the training day and manual). The quality of process findings indicated challenges in delivering interactive material and as such future iterations of SPIY will attempt to structure activities concisely and in the training sessions, promote ways in which the teachers develop confidence to facilitate discussions and role plays. Students responded positively to the material, particularly they reported the first aid and peer protective messages were helpful. Also students further reinforced the value of interactive processes, as such, practical and interactive material will continue to be included and supported. Interestingly, both the first aid and peer protective components were covered fairly equally and as such both components will continue to be emphasized in future iterations of the SPIY programme as well as the importance of both components emphasized in teacher training.

Importantly, the study provided example processes of ways in which to comprehensively evaluate implementation which provides a greater understanding of whether a programme can be effectively implemented. Each aspect of a process evaluation makes an important contribution to the overall understanding of implementation and also to our understanding of the programme design itself. The findings demonstrated how different elements of a process evaluation complement one another to provide a broad assessment. Deficiencies in any area could affect the interpretation of an outcome study, thus the inclusion of a process evaluation presents a more complete picture of programme evaluation. Data on implementation are collected to complement outcome analyses and identify issues for further refinement of the programme and it is clear that a process evaluation needs to be conducted [5]. This study provides some useful information about how to operationalize a comprehensive definition of a process evaluation and how the SPIY programme was implemented.

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Conflict of interest statement

None declared.

References


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