A systematic review of school drug education

Nyanda McBride

Abstract

This paper provides an up-to-date systematic review of the school drug education literature (to June 2001) and identifies components that have the potential for creating effective drug education programmes in schools. This paper is a summary of a 150-page review. The review adopts a well-defined search methodology, specific selection criteria, and has made a series of recommendations based on the findings of past reviews and recent primary studies that met the selection criteria. The review is inclusive of reviews and recent primary studies that involved young people in school settings that encompassed a classroom intervention, included drug-related behavioural measures and had a positive impact on students’ drug-related behaviours. The review identifies several areas that should be the focus of future programmes. These include timing and programming issues, content and delivery issues, teacher training, and dissemination. The review identifies several areas that should be the focus of future programmes. These include timing and programming issues, content and delivery issues, teacher training, and dissemination. The way forward is to continue to create and test interventions that bring together all components of the development, implementation and evaluation of school drug education that are effective in creating behaviour change, and that are practical to the school setting.

Introduction

There is an extensive body of literature on school-based drug education, extending over several decades, which has contributed to our understandings of the field. This literature is comprised of peer-reviewed journal articles, books, grey literature which is typically made up of reports produced by governmental educational and health departments, and papers delivered during conferences. The quality of this literature varies; however, there is a general understanding that recent contributions are of higher quality as more appropriate assessment methodologies have been applied to evaluations and research of later programmes (Sharp, 1994; Foxcroft et al., 1997; Tobler, 1997; White and Pitts, 1997; White and Pitts, 1998; Tobler et al., 1999).

Given the extensive amount of literature available on school-based drug education and the varying quality of this literature, there is a need to adequately collate the information to define the components that contribute to effective drug education based on literature that is of acceptable quality and scope. The systematic review summarized in this paper is bounded by a set of criteria. By defining the dimension of this review, comparisons can be more readily made with previous literature, and thus enable readers to assess the quality and contribution that future studies provide to the field.

The structure of this paper involves a description of the methodology used in the systematic review including criteria for inclusion, search method and a summary of search results. The paper then identifies components of drug education that have the potential for behaviour change. These
components are discussed under the main headings of Timing and Programming Considerations, Content and Delivery, Teacher/Facilitator Skills, and Dissemination. Recommendations are italicized within the text of each section.

Method

Criteria for inclusion into the systematic review

The primary aim of this systematic review is to identify potential components of drug education that can lead to behaviour change through a classroom-based approach. This task has been undertaken through a number of mechanisms. In the first instance, all reasonably available published and grey literature that in themselves provide a review of the field were accessed (1990 to June 2001). In the second instance, access of primary studies that focused on school drug education (1997 to June 2001) was made to assess their more recent contribution to the field.

Review of reviews (1990 to June 2001)

Undertaking an initial review of reviews served several purposes. Published reviews have, to varying degrees, identified previous well-conducted studies for inclusion, and have provided key concepts and/or recommendations to the field. In this way, much of the extensive literature of the past has already been assessed on quality for inclusion and summarized to a manageable format.

Rehm (Rehm, 1999), in his discussion about the quality of reviews for publication in the substance abuse areas, suggests that the usefulness of a review is determined by the rigor of its search method, the selection methods adopted and the recommendations made. Furthermore, he suggests that a common problem with reviews of the past is their failure to define the scope of the review in particular, search method and inclusion criteria of studies. Because of this, it has not been possible to identify whether the review was based on a subjective selection of articles by the authors or whether the selection clearly reflected all research in the area. Given these concerns, the criteria for accepting past reviews of drug education within this systematic review are based on the following considerations:

- A claimed review was a comprehensive, systematic literature review or meta-analysis of the area rather than a content review or opinion-based commentary (the review stated search strategies, selection and inclusion criteria, and provided recommendations for the future) (Rehm, 1999).
- The review encompassed the school setting and student group as a focus.
- The review encompassed classroom-based drug education.
- The review encompassed programmes from more than one locality or country.
- The published date of the review was 1990 or later (details about the field prior to 1990 were captured in these reviews and research methodology of primary studies prior to mid 1980 are poor) (Sharp, 1994; Foxcroft et al., 1997; Tobler, 1997; White and Pitts, 1997; White and Pitts, 1998; Tobler et al., 1999).
- The reviews set adequate guidelines determining inclusion of studies based on research design, allocation, analysis and measures.
- The review was able to be gathered during the 5-month time period allocated to accessing publications.

The reference lists of review articles were also systematically searched for any further publications/reports that were not identified through the electronic databases. These documents were then assessed using the above criteria.

Review of primary studies (1997 to June 2001)

A search was undertaken to identify primary drug education studies that were conducted or published subsequent to the most current literature reviews. A cut-off date of 1997 was selected for these types of publications, as the most recent comprehensive review of school drug education effectiveness included studies to 1997. These newer primary
studies were then assessed for inclusion into this systematic review based on the following criteria:

- Inclusive of school aged students in a school setting.
- Encompassed a classroom intervention.
- Included drug-related behavioural measures and had a positive impact on students’ drug-related behaviours.
- Adopted an adequate study design and methodology (experimental/quasi-experimental involving control group and baseline and follow-up assessment; discussed method of allocation to study group, level of study control; comparability of study groups at baseline, validity and reliability issues, maintained acceptable retention, method and unit of analysis, role of confounding, change and bias, monitored implementation).

Multiple papers of the same study published between 1997 and June 2001 were collated, and identified as one study in the following Results. As with the reviews, reference lists of the primary studies were systematically searched for any further publications or reports that were not previously accessed and could meet the inclusion criteria of this systematic review.

Search strategy

A combination of key words was used to identify appropriate publications for both the reviews and recent primary studies. These included: school, drug education, review, research, evaluation, project, study. Searches were undertaken within the following databases: ERIC (research in education and current index to journals in education), Science Direct (multidisciplinary), Current Contents (multidisciplinary), Expanded Academic (ASAP), EMB Reviews (Cochrane Database of Systematic Reviews), Eventline (international conferences), PsycInfo, Medline, EMBASE, ETOH (NIAAA Alcohol and Alcohol Problems Database), Dissertation Abstracts, SIGLE, Social Work Abstracts, National Clearinghouse on Alcohol and Drug Information, DRUG database, Alcohol and Alcohol Problems, Cochrane Collaboration Reviews, Internet search, and the University of Sydney Health Education Unit ‘Healthed’ database. The most productive database for school drug education articles proved to be PsycInfo; however, the database searches were not exhaustive as at least one-third of all articles were identified from the reference/bibliography lists of earlier publications.

Results of the searches

Reviews—1990 to June 2001

An initial electronic database search produced 113 reviews for potential inclusion. The reference lists of these publications revealed a further 52 publications that indicated potential worth as inclusions within a comprehensive review of alcohol and drug education in schools.

The total number of potential publications (n = 165) was critically analyzed and reviews were excluded based on the previously mentioned criteria. In particular, rejection occurred when abstracts indicated that potential reviews were commentaries or opinion-based articles and/or published prior to 1990. Various quality of publications were contained within this list and those that met the criteria for this systematic review numbered only 11 (Table I).

Of the 11 review articles that met the search and selection criteria defined by Rehm (Rehm, 1999), all were published in the 1990s, with seven of the reviews published in the later half of the decade. However, an analysis of the inclusion dates of articles within these reviews reveals that six of the reviews included articles to 1990, one to 1992, two to 1995 and one to April 1997 (one other did not provide this information). So although the publication dates of these articles suggest an up-to-date review of the area, the most recent of these reviews included primary studies nearly 5 years old, two others included primary studies 7 years old and the rest of the reviews included primary studies over 10 years old. It should also be noted that the 11 high-quality reviews represent the work of seven authors or teams of authors, with one author...
responsible for four of the reviews and another team of authors responsible for two of the reviews.

**Primary studies—1997 to June 2001**

The total number of recent primary study publications revealed during electronic database searches and scanning the reference lists of previously accessed papers totaled 69, representing 65 programmes. The total number of primary studies accepted into this review based on the above-mentioned criteria was five (7.7% acceptance), two of which were of the same programme (see reference list). Of the rejected studies, only three had acceptable evaluation methodology and included behavioural measures. All three (4.6%) reported no behaviour change as a result of their programmes. Two of these studies were Drug Awareness Resistance Education (DARE) involving abstinence goals and police officer instructors. The other rejected primary study was a reanalysis of a programme (published prior to 1997). This programme had a normative education focus which reported behavioural results in the first publication that were not replicated when appropriate analysis was applied in the second publication. The main reasons for rejecting studies were that they failed to measure drug-related behaviours, they had methodological problems, they failed to produce drug-related behaviour change or they focused on formative or process evaluation.

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**Table I. Accepted reviews**

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<th>Review authors</th>
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<tr>
<td>White, D. and Pitts, P.</td>
<td>1997</td>
<td><em>Health Promotion with Young People for the Prevention of Substance Misuse</em>. NHS Centre for Reviews and Dissemination, University of York.</td>
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Table II provides details of the primary studies accepted in this review. The primary studies from 1997 onwards that were accepted into this review comprise four separate programmes, three of which were classroom based. The fourth programme was a large-scale school/community programme. Two of the programmes were US based, one Australian and one conducted in The Netherlands. One programme provided the initial phase in the late 1980s; all other programmes were conducted in the mid to late 1990s.

Components that increase the potential for behaviour change in school drug education

The following section summarizes the content findings from accepted reviews and primary studies. Italicized text indicates recommendations for future drug education.

Timing and programming considerations

Timing of interventions

Few of the reviewers included information about an appropriate time in young peoples development in which drug education interventions could best be conducted. Recent primary studies either explicitly or implicitly identify that there are potentially three periods in students’ behavioural development when intervention effects are most likely to be optimized. First, programmes can be effective when they are delivered immediately prior to initial experimentation (Maggs and Schulenberg, 1998; Dijkstra et al., 1999; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001). These findings suggests that an inoculation phase when initial knowledge and skills about drug use and drug use issues are initiated has the potential to play an important part in modifying behavioural patterns and young people’s responses in drug-use situations. Secondly, research suggests that programmes should be provided during the period

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<td><strong>Main effect</strong></td>
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when most students are experiencing initial exposure (Maggs and Schulenberg, 1998; Dijkstra et al., 1999; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001). This early relevancy phase ensures that students gain exposure to programmes when information and skills are most likely to have meaning and practical application. Finally, some recent primary studies suggest that a later relevancy stage when prevalence of use increases and context of use changes, e.g. when young people are drinking alcohol and driving or when they are exposed to a larger and older group of patrons at licensed premises (Maggs and Schulenberg, 1998; Williams et al., 1999; Shope et al., 2001). This later relevancy phase is important in providing new knowledge and skills to suit the new situations that young people may be exposed. Programmes can be best tailored to a population group by using local prevalence data (White and Pitts, 1997; Maggs and Schulenberg, 1998; McBride et al., 2003; Shope et al., 2001).

Based on the needs of the target group

There is strong consensus among reviews and recent primary studies, that for school drug education programmes to be effective, they should be based on the needs and be relevant to the young people who are likely to participate in the programme (Bruvold, 1993; White and Pitts, 1997, 1998; Tobler et al., 1999; Williams et al., 1999; McBride et al., 2003). White and Pitts (White and Pitts, 1997) clarify this issue further by suggesting that to obtain students’ interest and enthusiastic participation in a programme, the students need to feel that the programme is meaningful and interesting to them. Unfortunately, very few programmes are directly based on young people’s experiences (White and Pitts, 1997). Some reviewers feel that a common reason for the failure of many drug education programmes can be directly linked to the failure of those programmes to engage student interest, because they are not developmentally appropriate or because activities are too abstract to be meaningful to the student group (e.g. values clarification) (Tobler et al., 1999).

Although reviewers of drug education voice consensus on the value of developing programmes that are relevant to students, little mentioned is made of how this task could best be undertaken. Recent primary studies have indicated that a formative phase prior to programme implementation is important (Maggs and Schulenberg, 1998; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001). This phase should involve focus interviews with the target groups so that content, scenarios and style of an intervention are based on the experiences and interest of the young people that it is trying to influence (Williams et al., 1999; McBride et al., 2003). This preliminary phase, although time consuming, may play a critical role in ensuring that programmes are successful in terms of behavioural effectiveness.

The goal of school-based drug education

It is of interest to note that reviewers of school drug education who have explicitly suggested the adoption of harm-minimization goals as an appropriate addition or alternative to non-use and delayed use goals are from countries other than the US (Sharp, 1994; White and Pitts, 1997). The majority of studies accepted within reviews and meta-analyses of school-based drug education are drawn from the North American prevention experience, and as such are dominated by goals of non-use and delayed use (Sharp, 1994; White and Pitts, 1997). This focus has limited the range of findings in the field to a small number of behavioural effects, i.e. that of delayed onset of use and consumption in the most cases, without extending the exploration of behavioural effects to other areas such as the potential change in experiences that young people have in drug use situations. In the past, if the adoption of a harm-minimization goal to school drug education had been made, it may well have resulted in a greater impact of school-based programmes than is currently documented in reviews of drug education. Unfortunately, school-based programmes with an implicit or explicit harm-minimization goal have rarely received evaluation attention other than basic process evaluation in either the UK, Canada.
or Australia (McLeod, 1997; Midford and McBride, 1997; White and Pitts, 1997).

Two recent primary studies included harm minimization as part of the programme. The Alcohol Misuse Prevention Study (Maggs and Schulenberg, 1998; Shope et al., 2001) included measures of harm in their assessment of change within a programme goal of abstinence/delayed use and identified significant effects for alcohol misuse (harm). McBride et al. (McBride et al., 2003) adopted a goal of harm minimization in relation to their alcohol programme and included harm reduction measures in their assessment of change. The main effects resulting from the programme suggest potential benefit from this change in paradigm. Over the study period, students who participated in the programme had a 10% greater alcohol-related knowledge, consumed 20% less alcohol, were 19.5% less likely to consume to harmful or hazardous levels, experienced 33% less harm associated with their own use of alcohol and 10% less harm associated with other peoples use of alcohol than did the comparison group. Given the limited number of longitudinal studies that have focused on this goal, there is a need to replicate the results in other localities to truly understand its potential value for school-based alcohol. In addition, formative research is required to assess the potential value of this approach for illicit drug education.

**Booster sessions**

Later reviews and recent primary studies consistently suggest the benefit of booster sessions over a number of years throughout the schooling years (Stead et al., 1996; White and Pitts, 1997, 1998; Maggs and Schulenberg, 1998; Dijkstra et al., 1999; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001). This advice reflects the addition of the social skills approach to drug education. More progressive interventions incorporating behavioural aspects such as skills training have been shown to achieve behavioural effects, maintained for 2–3 years after the intervention, if such interventions are characterized by booster sessions at a later stage (White and Pitts, 1997).

**Booster sessions provide the opportunity to reinforce and build on messages over a number of years suited to the age and development of the students as referred to in an earlier section. The number of sessions identified in the literature varies, but commonly involves a greater number of sessions in the initial year and fewer sessions in subsequent years (White and Pitts, 1997, 1998).**

White and Pitts (White and Pitts, 1997) suggest that programme intensity should be of 15 or more hours duration. Recent primary studies tend to recommend fewer sessions overall involving four (Maggs and Schulenberg, 1998; Williams et al., 1999; Shope et al., 2001), five (Dijkstra et al., 1999) to eight (McBride et al., 2003) initial sessions followed by three (Maggs and Schulenberg, 1998; Shope et al., 2001), five (McBride et al., 2003) or eight booster sessions (Williams et al., 1999), and at times a third booster phase when prevalence data indicates a rise in use and/or when context of use changes of five (Maggs and Schulenberg, 1998; Shope et al., 2001) to eight lessons (Williams et al., 1999).

**Content and delivery**

**Social influence (resistance skills training and normative education)**

There is a strong recommendation from reviewers and recent primary studies of school drug education to include social influence components into curriculum materials as it is suggested that they have a demonstrated effect on student’s behaviour compared to most other types of programmes (Hansen, 1992; Bruvold, 1993; Stead et al., 1996; Tobler and Stratton, 1997; White and Pitts, 1997; Maggs and Schulenberg, 1998; Dijkstra et al., 1999; Williams et al., 1999; Shope et al., 2001). However, such an approach needs to be used with cautions as detailed below.

A social influence approach is generally considered to include three key elements: basic information, resistance skills training and normative information.

Past research has indicated that normative education can contribute to effectiveness in programmes as young people often overestimate
the usage rate among their peers, and there is an association between perceived peer usage and individual drug usage. (Bruvold, 1993; Stead et al., 1996). It is suggested that the incorporation of normative education should involve a detailed assessment of the target group’s beliefs for different drug types and strategies should be developed to counter these normative beliefs (Bruvold, 1993; White and Pitts, 1997). Sharp (Sharp, 1994) acknowledges that research suggests that normative education seems more important in a social influence approach than does resistance skills training; however, she comments that problems arise when prevalence data works in the opposite direction to the aims of abstinence programmes, particularly for alcohol and as students get older.

Sharp (Sharp, 1994) has also questioned the effectiveness of social influence approaches, particularly the resistance skills training component. In particular, resistance training skills, although regularly reported as finding positive effects, have effects limited to a subgroup of the targeted population and often have methodological problems associated with the research. Part of the failure of any resistance skills training component is that it generally targets only two of the many risk factors for young people’s drug use, i.e. peer pressure and media influences, and adopts many of the same strategies as the ‘...affective strategies of 1970s which are considered ineffective in reducing alcohol and other drug use’ [(Gorman, 1996), p. 206].

A recent harm-minimization study achieved its main effects using an alternative to resistance skills training (McBride et al., 2003). The SHARHP programme focused on providing skills training related to the stated goal of harm minimization in alcohol education (rather than resistance skills training). Students were provided with skills to reduce the potential for harm to occur and, if it did occur, with the skills to reduce the likely impact of the harm, rather than with skills to resist pressure to use. This change in context of social influence from resistance skills training, to harm reduction skills training, maintains the need for teaching methods that allow students to practice behaviours in a low risk situation, using real-life scenarios, and provides young people with important practice that they can take with them to real-life situations. The results of this approach demonstrate behavioural change equal to or greater than programmes that have adopted a resistance skills training approach (Perry et al., 1993; Gilchrist et al., 1987; Williams et al., 1999; Shope et al., 2001; McBride, 2002).

Research is required to clarify the contribution that resistance skills training can make in modifying young peoples behaviour. Similarly, research is required to replicate the potential of harm reduction skills training in school drug education programmes.

**Interactive, activity oriented**

A key leader in reviews looking at the nature of interaction that occurs in the drug education classroom is Tobler in her series of meta-analyses (Tobler, 1997; Tobler and Stratton, 1997; Tobler et al., 1999). Subsequent reviewers have used Tobler’s work on which to base their recommendations that classroom involvement be of an interactive nature (Bruvold, 1993; Sharp, 1994; Stead et al., 1996). The benefits of interactive programmes have been reinforced by recent primary studies (Maggs and Schulenberg, 1998; Dijkstra et al., 1999; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001).

Tobler has identified that interactive programmes are significantly more effective in impacting on young people’s drug use behaviour than non-interactive programmes even when controlling for variables such as drug type and ethnic differences (Tobler and Stratton, 1997). Interactive programmes are at a minimum twice as effective as non-interactive programmes (Tobler and Stratton, 1997) and up to 4 times as effective as non-interactive programmes (Tobler, 1997). Tobler et al. (Tobler et al., 1999) identify that it is the exchange of ideas and experiences between students, the opportunity to practice new skills and obtain feedback on skills practice that acts as a catalyst for change rather than any critical content feature of the programme.
Tobler and Stratton (Tobler and Stratton, 1997) suggest that if current programmes were replaced with interactive programmes, the effectiveness of school drug education would increase by 8.5%. However, successful programmes receive poor marketing and are often not readily available for schools to use.

Focus on behaviour change, rather than knowledge and/or attitudes

The key determinant of successful school drug education programmes, as defined by reviewers, is whether a programme is capable of significantly impacting on students’ drug use behaviour (Tobler, 1992; Sharp, 1994; Foxcroft et al., 1997; Tobler and Stratton, 1997; Tobler et al., 1999; White and Pitts, 1998). Most reviewers have made some assessment of the number of studies within their acceptance criteria that were able to achieve behaviour change and most concur that it is possible to change students’ drug use behaviours to a certain degree through school-based programmes. There is a general concern, however, that behavioural effects are often limited to a subgroup of the population of interest and often decay over time. Stead et al. (Stead et al., 1996) argue that the reduced impact of a programme in the years following its implementation is not necessarily a bad thing, as the period when it is having an impact provides an added window of prevention opportunity that would not have otherwise been available. In addition, young people may have a greater ability to quit their use, and may have lowered mortality and morbidity as a result of this period of delayed or reduced use (Stead et al., 1996). It is perhaps naive to expect classroom drug education to impact on the behaviour of students for more than the time when it is being implemented, particularly when considering the numerous variables external to the school that influence drug use behaviour; yet, in some cases programme effects do extend beyond implementation. Some studies show behavioural effects for at least 1 year after implementation has been completed (Maggs and Schulenberg, 1998; McBride et al., 2003; Shope et al., 2001). These results reinforce the use of regular booster sessions provided to school-age students that are developmentally appropriate and that are relevant to the target group.

Tobler and Stratton (Tobler and Stratton, 1997) in their more inclusive review of school drug education identified that between the years 1978 and 1990, only 36% of programmes included behavioural measures and therefore only a small proportion of studies provide the basis of our understanding about behavioural effects. Reviewers also recognize that poor research methodology has contributed to the small number of studies that are accepted into reviews of programme effectiveness and suggest that optimizing methodology should be a critical area for future research (Sharp, 1994; Foxcroft et al., 1997; White and Pitts, 1997; Tobler et al., 1999). Of the 69 recent (post 1997) primary study publications (65 programmes) identified as part of this systematic review, only 27 studies (41.5%) incorporated behavioural measures. As with past findings, this trend for poor inclusion of behavioural measures continues to limit our ability to clearly understand factors that can potentially impact on young people’s drug use behaviours.

Multi-drug focus or single drug focus

Tobler (Tobler, 1992, 1997) provides the only detailed information about the potential of single or multi-content focus of school-based drug education. In her 1997 meta-analysis, Tobler offers support for adopting programmes with a single drug focus, as her results (based on high quality programmes) indicated that tobacco programmes were 3 times more effective than programmes that focused on multiple drugs within the same programme. Alcohol programmes, although not as successful as tobacco programmes, were also more successful than multi-drug programmes (Tobler, 1992). These results are particularly pertinent to students older than 12 years of age, younger students may benefit from general drug education (Tobler et al., 1999); however, this should be guided by local prevalence data (White and Pitts, 1997; Maggs and Schulenberg, 1998; McBride et al., 2003; Shope et al., 2001). The use
of prevalence data suggests that one of the benefits of single programs is that they are focusing on more commonly used substances by young people and because of this may be more amenable to change. White and Pitts (White and Pitts, 1997) support Tobler in her conclusions that drug education programmes should be single drug focused. Recent primary studies also point towards a recommendation of single drug focused programmes. Of the three primary studies that gained main effects, two were alcohol specific and one was multi-drug focused (with main effect in past-week and past-month alcohol use) (Maggs and Schulenberg, 1998; Williams et al., 1999; McBride et al., 2003). Of the primary studies that gained subgroup effects, one was alcohol focused and one was smoking focused (Dijkstra et al., 1999; Shope et al., 2001).

Peer interaction/peer leaders

Several reviewers identified the potential role of peers in school-based drug education (Tobler, 1992, 1997; Sharp, 1994; Tobler and Stratton, 1997; White and Pitts, 1997, 1998; Tobler et al., 1999). Tobler in her 1992 meta-analysis provides the most detailed account of the potential role that same age and older peers. In this analysis Tobler compared peer programmes (interactive and/or peer leader) with non-peer programmes (knowledge, affective and alternatives programmes) and found that peer programmes were more effective than non-peer programmes. It should be noted, however, that Tobler’s (Tobler, 1992) criteria used to determine peer programmes was more loosely used than that which may generally be considered a peer programme of trained peer leaders facilitating a classroom of same-age or younger peers. Tobler included opportunity for peer interaction among class members as part of her definition of peer programmes. Tobler (Tobler, 1992) claims that peer programmes compared to no programme resulted in a 16% decrease in drug use and a 12% advantage when compared to other programmes.

Tobler (Tobler, 1992), however, compared the effectiveness of several types of classroom leaders in more detail. She included mental health professionals/counselors, general classroom teachers, health education specialist classroom teachers, same-age peer leaders and college students/others in her analysis. The results indicated that there was no significant difference in effectiveness between the different types of classroom leader. The non-significant differences showed that mental health professionals/counselors, health education specialists and peer leaders had a greater effect size compared to general classroom teachers and college students/others. It should be noted, however, that same-aged peer leaders were supported by classroom teachers who managed and maintained classroom behaviour (Tobler, 1992), and that often peer leaders gained greater benefit than classroom students from peer leader programmes. The only recent primary study that adopted the use of peer leaders was not able to isolate any additional positive or negative effect of this component (Williams et al., 1999). Thorough research in the processes and outcomes that can be expected from peer leaders, in comparison to other alternatives, is required before they can be accepted as part of effective drug education in schools (Sharp, 1994). These assessments should also take into account practical considerations of teacher time, timekeeping, peer training, peer leader absence, length of time between peer leader training and their use in the classroom, and any additional funding required to conduct such programmes.

More importantly, however, Tobler (Tobler, 1992) notes that the presence of peer leaders in a classroom does not make a peer programme, but rather peer interaction is the key component for success. It is the structured and unstructured task-oriented peer interactions between classmates that is the important variable in effectiveness (Tobler et al., 1999). Students must have the opportunity to interact in small group activities, to test out and exchange ideas on how to handle drug use situations and gain peer feedback about the acceptability of their ideas in a safe environment where the leader acts as a facilitator maintaining task oriented behaviour, maximizing opportunity for peer interchange, providing utility information,
correcting misconceptions and providing skills practice (Tobler, 1992; Tobler et al., 1999). The presence of a peer leader in addition to the classroom teacher may be able to increase the amount of opportunity for structured classmate interaction to occur and Tobler (Tobler, 1992) identifies that it is probably this rather than the direct impact of a peer leader that has provided peer leaders with their equivalent effect size to mental health professionals and health education specialists (Tobler, 1992).

Teacher training/skills of teacher/facilitator

Teacher training

Teacher training is a feature of most successful drug education programmes (Sharp, 1994; Tobler and Stratton, 1997; Maggs and Schulenberg, 1998; Dijkstra et al., 1999; Tobler et al., 1999; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001). Tobler (Tobler, 1992) states that drug education is best taught by classroom teachers as they have first-hand knowledge of students’ needs and developmental level, are best placed to integrate drug education at an appropriate time and level for their student, and to modify programme components to suit their class needs. To ensure that school-based implementers have adequate knowledge and skills, and are comfortable delivering drug education programmes, a certain type and level of training is required. Training should directly train the teacher involved with the classroom delivery (Sharp, 1994; Maggs and Schulenberg, 1998; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001) as ‘train the trainer’ models often lack success due to key teachers’ lack of confidence, skills and experience in training colleagues (Sharp, 1994). Training is of most value when provided by programme developers, is offered to motivated teachers (Tobler et al., 1999) and should be followed up with booster training (Sharp, 1994; Maggs and Schulenberg, 1998; Williams et al., 1999; McBride et al., 2003; Shope et al., 2001).

Dissemination

Marketing—researcher to practitioner

Several reviewers offer concerns about the dissemination of effective school drug education programmes noting that there are problems in the availability of well-tested interactive programmes with proven behavioural effectiveness (Foxcroft et al., 1997; Tobler, 1997). Many of these programmes are researcher driven, and are most often not provided in a form that teachers can access and use immediately in their classroom (Tobler, 1997). In addition, these programmes receive little marketing in schools, and therefore little is known about them by teachers and other programme practitioners. However, it remains that effective programmes should be made readily available to schools in a useable format.

Foxcroft et al. (Foxcroft et al., 1997) suggest that programme developers have some responsibility to identify to potential purchasers if programmes have not been evaluated, and if a programme has been evaluated and achieved no behavioural effect then this information should also be provided if marketing is to occur. Ideally, these programmes should be modified and retested, or should not continue to be supported. There is also some need for school staff to be provided with guidance in the selection of programmes. It should be noted that discussions with teachers indicate that ineffective programmes such as DARE continue to be accessed by schools because of their ready availability and because the cost of programme materials are within school budgets (Silvia et al., 1997).

Cost

The cost of school drug education is an important practical consideration for schools. The cost of implementing drug education programmes at the school site involves financial but also personnel costs related to training, timetabling and teacher time for programme planning, classroom and material organization. Reviews of school drug education offered very little information about the cost of programmes.
Of the five recent primary studies that gained either main or subgroup effects, four are primarily classroom based (Maggs and Schulenberg, 1998; Dijkstra et al., 1999; McBride et al., 2003; Shope et al., 2001). The fifth offered an extensive amount of comprehensive school and community activity over a number of years, and although no cost analysis or summary is available, it is likely to be an expensive undertaking (Williams et al., 1999) with little information about the level of effect that each component contributed to the overall results. If classroom-based drug education continues to achieve similar behavioural effects to the more comprehensive approach then, given cost considerations, effective classroom based programmes should be routinely made available to schools.

**Conclusion**

This systematic literature review of school drug education has attempted to synthesize understandings about the development, implementation and evaluation of programmes that can contribute to better drug education in schools, and particularly those programmes that can impact on young people’s behaviour. Additionally, the review has attempted to identify potential areas in which more work can be undertaken to increase understandings and abilities in the area. There are, however, limitations to this type of undertaking. A systematic literature review can only be based on published literature that is reasonably available and there is some bias associated with this access. In particular, most published studies of school drug education evaluation are based on the North American experience with their associated philosophies and cultural context (Sharp, 1994; Foxcroft et al., 1997; White and Pitts, 1997, 1998). Ineffective programmes, although not included in this review, can provide important information about components and strategies that require some modification, and subsequent testing, to increase effectiveness. Programmes are generally targeted at white middle class populations and do little to increase knowledge about programmes for other population groups (Tobler and Stratton, 1997). Published programmes tend to be developed by research organizations (Stead et al., 1996); however, there is also a enormous amount of drug education activity that is occurring every day that has not received any formal evaluation to assess its impact on behaviour. This activity may or may not be beneficial to young people; however, its impact will only be known if evaluation occurs. Funding and evaluation expertise may not be available to undertake evaluation in these circumstances, and creative solutions need to be developed between funders, researchers and practitioners to undertake such evaluation or to make well-tested programmes, with behavioural impact, more widely available to practitioners. This review has also, purposely, not included the enormous literature about school drug education available from commentaries and opinion-based publications by experts and others in the field. This task has not been undertaken due to the difficulties of separating opinion from research findings, and because of the extensiveness of the task in adequately and systematically assessing all input.

Stead et al. (Stead et al., 1996) suggest that the drug education field has seen the best that it can achieve and without the introduction of more costly approaches, such as comprehensive school and community approaches, it is unlikely that further behavioural achievements will result. This review has found the opposite. There is in fact much refinement that can occur, and the way forward is to continue to create and test interventions in an attempt to bring together all components of the development, implementation and evaluation of school drug education that have the potential for behaviour change. However, improvements to school drug education research and programme development cannot occur in isolation to the practical implementation of programmes at the school level. Identification of barriers and strategies to overcome barriers to effective drug education in schools is just as important as testing out and making such programmes readily available to schools.
School drug education is not isolated from broad fields of knowledge such as theories of behaviour change, models of health promotion and the principles of teaching, and although not overtly commented on in this paper, they are important contributions to effective drug education. Conceptually, much of the work done in school drug education has a theoretical basis in social psychology. There is some suggestion that the consideration of additional risk and protective factors as well as a broadening of the theoretical assumptions that inform drug education development will result in continued increases in the effectiveness of interventions. In particular, there is some indication that the resiliency literature may prove to be of value to the drug education field (Toumbourou and Gregg, 2002).

Research on school drug education programmes often bases discussion and recommendations on the statistical significance of change demonstrated during analysis and this is an appropriate starting point. It is also important, however, to progress from this to assess the practical significance of programmes, and the ability of programmes to transfer from research studies to the real world of schools and classrooms. Demonstration of practical significance is the ultimate test of an intervention and one of the most valuable contributions that an evaluator can make to the field is to discuss the practical implications of their evaluation. Tobler provides an interesting example of practical significance of drug education using a medical model comparison (Tobler, 1992; Tobler and Stratton, 1997). Her work identifies that interactive programmes offer a mean effect size of 0.2 equivalent to a 9.5% success rate with a mean programme time of 10 hours (Tobler and Stratton, 1997). In the medical field, it was deemed unethical to withhold the release of aspirin because of its effect size of 0.035 or 3.5% success (Tobler, 1992; Tobler and Stratton, 1997). Clearly, if similar considerations are given to the prevention field, then it would be unethical for interactive programmes not to be made widely available to schools.

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741


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