The Effectiveness of School-Based Curriculum Suicide Prevention Programs for Adolescents

Family Health
Child Health

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**To determine the effectiveness of interventions included in the Mandatory Health Programs and Services Guidelines (MHPKG), the following systematic reviews were completed and funded by the Public Health Research, Education and Development (PHRED) Program of the Public Health Branch, Ontario Ministry of Health.**

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*The conclusions of the reviews are based on the available evidence. They do not necessarily represent the views of the Public Health Branch, Ontario Ministry of Health. This report may be copied for circulation as appropriate. Please ensure that the PHRED Program, Public Health Branch, Ontario Ministry of Health is acknowledged.*
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PREFACE

The Public Health Branch of the Ontario Ministry of Health released new Mandatory Health Programs and Services Guidelines (MHPSG) in December 1997. Although the MHPSG provide guidelines for a wide range of public health practices in Ontario, the strength of evidence for many of the guidelines has not been summarized in a systematic way.

In 1998-1999, the Public Health Branch provided funding for the Effective Public Health Practice Project. The mandate of the project was to complete 15 summary statements based upon systematic reviews of the effectiveness of specific requirements of the MHPSG. Each review was linked to one of the three general standards or three program standards. The reviews summarize the best available research evidence for public health practice in these areas. Research evidence is one piece of information needed to inform decision making in public health. Other factors, such as the local environment, local priorities, and available resources are also important.

The reviews were completed by review groups composed of members of the Ontario Public Health Research, Education and Development (PHRED) Program Health Units as well as representatives from other Health Units around the province. The PHRED Provincial Steering Committee has overseen the project.

Potential review topics were initially identified through a survey of public health practitioners and managers across Ontario. Each review group followed a systematic approach that included comprehensive search strategies and quality assessment of each primary research study selected for inclusion in the review.

One of the primary objectives in completing this work was to ensure that it is relevant to public health practitioners in the field. We contacted all Medical Officers of Health and asked for volunteer experts. The response was tremendous and more than 100 practitioners and managers from over 90% of health units across Ontario agreed to take on the role of peer reviewers for the draft reports.

This project already has had many benefits. Public Health professionals have developed skills in completing systematic reviews and have increased awareness of the importance and feasibility of evidence-based practice. Through this project, we have established new links with the Cochrane Collaboration. We hope that several reviews will be registered with the various Cochrane Review Groups, making them accessible to the international public health community. Finally, the process of completing this project has contributed to the development of a strong province-wide network of public health professionals.
School-Based Curriculum Suicide Prevention Programs for Adolescents

Public Health Mandate  To promote the safety and mental health of youth through the mandatory programs of injury prevention and child health. Suicide prevention programs have been developed as a strategy to address this mandate.

Background  Suicide is one of the leading causes of death among teenagers aged 15 to 19 years in Canada, second only to motor vehicle traffic accidents. The five-year suicide rate in Canada from 1986 to 1990 was 13 per 100,000, accounting for approximately 24% of all teenage deaths.

The rate of suicide for young men is six times greater than for young women, but teenage women are hospitalized for attempted suicide at a rate twice that of teenage men. The rate of suicide for those in the 15-19 year age group has increased at least four-and-a-half-fold for males and three-fold for females over the past 30 years.

Adolescent suicidal behaviour is a complex issue with many possible determinants. Some of the risk factors that have been associated with teen suicide include psychiatric conditions such as severe depression, abuse of alcohol and drugs, poor problem-solving skills, low self-esteem, loss, and insufficient family support.

Issue  Complex factors have been identified which contribute to increasing the risk of adolescent suicide. A relatively new approach to suicide prevention among adolescents involves school-based curriculum programs which are now widely used in the United States and Canada, either on their own, or in conjunction with other programs.
There has been a move to mandate suicide-prevention curricula in the United States. However, program evaluation is limited. There are implications for ensuring that limited resources are used in a cost-effective manner.

**Finding the Answers**

A systematic review of the literature was undertaken to evaluate curriculum-based suicide prevention programs and their impact on outcomes including knowledge, attitudes, and behaviour related to suicide, and gender-related differences in response to the programs.

**What's the Evidence?**

- Rigorous evaluation of curricula in five studies has indicated that programs may improve suicide-related knowledge and attitudes, as well as mental health indicators, such as perceived stress, reduced anger, and increased self-esteem.
- When findings from four less rigorous studies were taken into account, negative program effects were identified, especially for males who may be at higher risk for suicide.
- However, the evidence is mixed, indicating both significant and non-significant findings for similar outcomes, and both beneficial and harmful effects for some participants.

**Implications for Practice and Research**

- There is insufficient evidence to support a school-based curriculum suicide prevention program for adolescents.
- In order to use resources in a cost-effective manner, further research is warranted which evaluates the following:
  - the impact of comprehensive school health programs, of which curriculum-based interventions may be a part, on the health of adolescents;
  - the effect of curriculum programs on actual suicidal behaviour such as suicide attempts or completions;
  - interventions which effectively target specific groups of adolescents; and,
  - programming tailored to adolescents who have been identified as high-risk for suicide, as well as that which addresses gender issues, should be evaluated.
More Sources of Information


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School-Based Curriculum Suicide Prevention Programs for Adolescents

Issue
Suicide is one of the leading causes of death among teenagers aged 15 to 19 years in Canada, second only to motor vehicle traffic accidents. The rate of suicide for those in the 15-19 year age group has increased at least four-and-a-half-fold for males and three-fold for females over the past 30 years.

A relatively new approach to suicide prevention among adolescents involves school-based curriculum programs which are now widely used in the United States and Canada, either on their own, or in conjunction with other programs. There has been a move to mandate suicide-prevention curricula in the United States. However, there is limited information available about the effectiveness of these programs on adolescent health. There are implications for ensuring that limited resources are used in a cost-effective manner.

Background
The five-year suicide rate in Canada from 1986 to 1990 was 13 per 100,000, accounting for approximately 24% of all teenage deaths. The rate of suicide for young men is six times greater than for young women, but teenage women are hospitalized for attempted suicide at a rate twice that of teenage men.

Adolescent suicidal behaviour is a complex issue with many possible determinants. Some of the risk factors that have been associated with teen suicide include psychiatric conditions such as severe depression, abuse of alcohol and drugs, poor problem-solving skills, low self-esteem, loss, and insufficient family support.

Public Health Mandate
Public health units aim to promote the safety and mental well-being of youth through the mandatory programs of injury prevention and child health. Suicide prevention programs have been developed as a strategy to address this mandate.

What’s the Evidence?
A variety of school-based curriculum suicide prevention programs have been rigorously evaluated. The findings indicate that programs may improve suicide-related knowledge and attitudes, as well as mental health indicators, such as perceived stress, reduced anger, and increased self-esteem.
However, both beneficial and harmful effects have been identified for some participants. Programs may need to be modified for adolescents who are identified as high-risk for suicide and may need to be tailored differently for males and females.

Implications

• There is insufficient evidence to support a school-based curriculum suicide prevention program for adolescents.
• In order to use resources in a cost-effective manner, health practitioners require evidence about effective strategies for suicide prevention that is obtained from rigorous research and program evaluation.
• Funding and support for research-based activities which address these issues will facilitate the development of programming which is effective in the prevention of adolescent suicide.

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ABSTRACT

Objective
To summarize evidence about the effectiveness of school-based curriculum suicide prevention programs for adolescents.

Methods
This overview is an update of a larger overview, first collecting literature to the end of 1995, and now to June, 1998. A comprehensive search of published literature resulted in retrieval of a total of 228 articles. Only nine studies met the relevance criteria.

Results
The evidence indicates mixed results with both significant and nonsignificant impact on the outcomes of suicide risk behaviours and suicide-related knowledge and attitudes. Furthermore, the evidence indicates both beneficial and harmful effects of the programs. Some studies indicated detrimental effects of the programs on suicide-related attitudes, hopelessness, and coping, particularly among males who are at greater risk for suicide.

Conclusion
The findings of this review indicate that there is currently insufficient evidence to support school-based curriculum suicide prevention programs for adolescents. The literature suggests that more broadly based comprehensive school health programs should be evaluated for their effectiveness in addressing the determinants of adolescent risk behaviour.
BACKGROUND

Introduction
Suicide is one of the leading causes of death among teenagers aged 15 to 19 years in Canada, second only to motor vehicle traffic accidents (Hanvey et al., 1994). The five-year suicide rate in Canada from 1986 to 1990 was 13 per 100,000, accounting for approximately 24% of all teenage deaths (Hanvey et al.). The rate of suicide for young men is six times greater than for young women, but teenage women are hospitalized for attempted suicide at a rate twice that of teenage men (Hanvey et al.). Adolescent suicidal behaviour is a complex issue with many possible determinants. Some of the risk factors that have been associated with teen suicide include psychiatric conditions such as severe depression, abuse of alcohol and drugs, poor problem-solving skills, low self-esteem, loss, and insufficient family support (Brent et al., 1993; Cole, 1989; Levy et al., 1989; Morano et al., 1993; Overholser et al., 1995).

The rate of suicide for those in the 15-19 year age group has increased at least four-and-a-half-fold for males and three-fold for females over the past 30 years (Mao et al., 1990; McNamee et al., 1994). Possible causal mechanisms for this trend include the increased prevalence of depressive disorders and substance abuse, increased family disruption and an increase in the social stressors (such as poverty and unemployment), that have extensive consequences for youth (Bagley, 1992; Diekstra et al., 1995).

The prevention of youth suicide is relevant to the Mandatory Health Programs and Services Guidelines (Ontario Ministry of Health, 1997) in the areas of child health and injury prevention. A relatively new approach to suicide prevention among adolescents involves school-based curriculum programs. These are now widely used in the United States and are also popular in Canada (Garland et al., 1993; Thibault, 1992). Most of the school-based programs have one or more of the following goals: (a) to heighten awareness of the problem of suicide, (b) to promote case finding through description of warning signs and encouragement of disclosure, (c) to provide information about mental health resources, and (d) in a minority of programs, to improve the teenager’s coping abilities (Shaffer et al., 1988).

Review Question and Objectives
This review answered the question: What is the effectiveness of school-based curriculum suicide prevention programs for adolescents? The objectives of the review were to assess the impact of such programs on outcomes including knowledge, attitudes and behaviour related to suicide and to assess gender-related differences in response to the programs.

METHODS

Criteria for Study Selection
This review was an update of an earlier review of school-based curriculum suicide prevention programs for adolescents (Ploeg et al., 1996). Relevance criteria determined whether the study: (a) evaluated a school-based curriculum suicide prevention program for adolescents, (b) described an intervention within the scope of public health practice.
Search Strategy

The three search strategies used in this overview to search for published articles included on-line computer searches, hand searches of selected journals, and searches of reference lists. An on-line search of MEDLINE, CINAHL, PsychINFO, and Social Sciences Index was conducted for the years 1980 to June 1, 1998. Key words used were adolescents and suicide prevention, stress management, depression, community mental health and evaluation. The Public Health Effectiveness database was also searched. Eighteen key public health and adolescent-related journals were hand-searched from 1990 to 1998. Some of the journals that were hand-searched included the American Journal of Health Promotion, Journal of Adolescence, Journal of Adolescent Health Care, Journal of School Health, Public Health Nursing, Suicide and Life-Threatening Behavior, and The Canadian Journal of Public Health. Relevant references back to 1980 from each article were identified, retrieved and reviewed. In total, 41 potentially relevant articles were retrieved, in addition to the 187 articles retrieved in the first overview.

Review Procedures

The relevant articles were rated for quality using a quality assessment tool. The tool was developed, pretested and modified, and included the following criteria: (a) selection bias (representativeness of the sample and percentage of selected individuals who agreed to participate), (b) study design, (c) control for confounders, (d) blinding (of outcome assessors and study participants), (e) reliability and validity of data collection methods, and (f) withdrawals and drop-outs. Each of the six criteria was rated as 'strong,' 'moderate,' or 'weak,' according to pre-established guidelines. Each study was assigned a global rating of 'strong,' ‘moderate,’ or ‘weak.’ For an article to be judged ‘strong,’ a minimum of four of the six criteria had to be rated as ‘strong’ with no ‘weak’ ratings. For the ‘moderate’ category, there could be less than four ‘strong’ ratings and a maximum of one ‘weak’ rating. A ‘weak’ rating meant that two or more criteria were rated ‘weak.’ All quality ratings were completed by two independent reviewers who met when necessary to discuss differences in ratings, reaching consensus on all ratings. The data extraction tool used for the first overview was used for this review.

RESULTS

Of the 41 new articles deemed potentially relevant, three met all the relevance criteria. These articles were added to seven studies found to be relevant from the first review. One of the new articles was a longer-term follow-up of a study included in the first review. Thus, this updated review included nine studies, with one study published in three related articles. Of the nine studies, one was judged as methodologically ‘strong,’ four were ‘moderate’ and four were rated as ‘weak.’ The most frequent weaknesses
were lack of reliability and validity of data collection tools, inadequate control for potential confounders, lack of blinding of outcome assessors and study participants, and selection bias.

**Characteristics of the Studies**

Seven of the nine studies were conducted in the United States, while two were conducted in Israel. The populations most frequently involved in the programs were adolescent high school students in Grades 9 and 10, followed by students in Grades 8, 11, and 12. The interventions used in the studies involved suicide education and general coping skills training. The intensity and duration of the sessions ranged from a single, one and one-half hour session to 180 sessions of 55 minutes each held over two semesters or 10 months. The intervention was most commonly provided by regular school teachers with additional training, followed by school counsellors or social workers, mental health specialists, and a school nurse. The intervention location was always the high school.

All outcomes were classified into five categories. The most commonly measured outcomes included those in the categories of knowledge, attitudes or intentions (89%), mental health status and development (56%), satisfaction with program (33%), health risk behaviours (22%), and social health indicators (11%). Six of the nine studies measured outcomes within one month of the intervention. The remaining three studies measured outcomes at 10 weeks, 5-10 months and 18 months of the intervention. Table 1 summarizes the design, participants, interventions, and outcomes of the strong, moderate, and weak studies. Appendix 2 summarizes studies that were excluded from the review, their associated interventions, and reasons for exclusion.

**Outcomes of the Studies**

Only two studies examined actual suicide risk behaviours such as suicide attempts among adolescents in response to the intervention. Eggert et al. (1995) found that self-reported suicide risk factors, including suicidal thoughts, threats and attempts, decreased significantly from pre- to posttest in two intervention groups, as well as in a third assessment-only group. No significant differences were found among the three groups at the 10-month follow-up. A study rated as methodologically weak found no significant difference in self-reported suicide attempts between the intervention and control groups 18 months after the intervention (Vieland et al., 1991).

Three studies examined the impact of the intervention on indicators of suicide risk (such as depression) rather than on actual suicidal behaviours. Two studies assessed the impact of the intervention on risk for suicide as measured by the Israeli Index of Potential for Suicide, a tool that assesses the combined concepts of depression, anxiety and emotionality (Klingman et al., 1993; Orbach et al., 1993). Klingman et al. (1993) found a greater reduction in risk of suicide for the intervention than control group and for males compared to females. Orbach et al. (1993) found an overall decrease in risk for suicide and a larger decrease for females than males in two schools. Eggert et al. (1995) found a significant decrease in depression from pre- to posttest in both intervention groups as well as the assessment-only group. They found no statistically significant difference in depression among the three groups at follow-up.

Four studies examined the impact of the intervention on coping. Two studies found improvements in coping skills following the intervention (Klingman et al., 1993; Orbach et
al., 1993). However, two of the weak studies found somewhat contradictory results. Spirito et al. (1988) did not find a main effect of the curriculum on coping but did find that female students were more likely than males to benefit from the curriculum. Overholser et al. (1989) found that while females had reduced maladaptive coping after the intervention, males actually had increased maladaptive coping, an unexpected, negative result of the program.

There were also mixed findings of the impact of the curriculum on hopelessness. Eggert et al. (1995) found that hopelessness decreased from pre- to posttest in both intervention groups as well as the assessment-only group. Spirito et al. (1988) did not find a main effect of the curriculum on hopelessness, but did find that females were more likely to have decreased hopelessness than males after the intervention. Overholser et al. (1989) found that females had reduced hopelessness after the intervention but that for males, hopelessness actually increased.

A number of studies also examined other outcomes related to mental health. Eggert et al. (1995) found that there was reduced perceived stress, reduced anger, and increased self-esteem from pre- to posttest in all three groups. They also found increased personal control in the two intervention groups. Orbach et al. (1993) found increased ego identity after the intervention. Klingman et al. (1993) found no difference in loneliness following the intervention. Eggert et al. (1995) also found that the curriculum had a positive effect on social support from pre- to posttest among all three groups.

Studies also examined the impact of the curriculum programs on knowledge, attitudes, and intentions related to suicide. Findings indicated both beneficial and harmful effects of the programs on some participants. Three studies found a significant improvement in knowledge related to suicide (Klingman et al., 1993; Kalafat et al., 1994; Spirito et al., 1988). Overholser et al. (1989) found that suicide knowledge improved only for those students who knew a peer that had attempted suicide. One study found that only three of nine items from a suicide knowledge and attitude instrument showed significant improvement after the intervention (Shaffer et al., 1991).

Kalafat et al. (1994) found improved attitudes related to suicide after the curriculum. Kalafat et al. (1996) found that a greater percentage of students in the intervention group than in the controls would tell an adult about a suicidal peer. Nevertheless, they found that only 29-40% of all students receiving the intervention would tell an adult about a suicidal peer. Ciffone (1993) found improved attitudes related to suicide following the intervention. Spirito et al. (1988) found that there was no main effect of the curriculum on suicide attitudes but that females were more likely than males to benefit from the program in terms of improved attitudes.

Two studies found negative effects of the curriculum on attitudes, particularly among males. Overholser et al. (1989) found that while attitudes improved for females, they worsened for males. Shaffer et al. (1990) found that suicide attempters who received the program, particularly males, were more likely than controls to think that talking about suicide in class made some students more likely to try to kill themselves. Shaffer et al. (1991) found that a significantly higher proportion of students, particularly males, exposed to the program who had initially said that they did not feel suicide could be a reasonable solution to problems, changed their minds to indicate that they now thought it could be, compared with controls.
Three studies examined the subjective response of the students to the curriculum programs. Klingman et al. (1993) found that 75% of the students reported high satisfaction with the program, with only 3.9% indicating low to average satisfaction. Kalafat et al. (1994) found that 43% of students rated the classes as helpful, 53% were neutral, and 3% rated the classes as upsetting. Shaffer et al. (1991) found that fewer than 10% found the program upsetting and that females rated the program more positively than males. Shaffer et al. (1990) found that male suicide attempters were more likely to know someone who was upset a lot by the program.

**DISCUSSION**

The evidence related to the effectiveness of school-based suicide curriculum programs for adolescents based on this review does not support the use of such programs. Study findings revealed both significant and non-significant results for similar outcomes, as well as both beneficial and harmful effects of the programs on some students. There were significant limitations in the quality of the research reviewed, with only one study rated strong and four-rated moderate. Study limitations reflected threats to internal validity in areas such as lack of reliability and validity of data collection tools and lack of control for potential confounders. One of the common threats to external validity was selection bias or participation of fewer than 80% of eligible participants in the studies. The weak studies were more likely than strong/moderate studies to suggest negative or harmful effects of the curriculum programs.

Only two studies examined the outcome of actual suicidal behaviours, specifically suicide attempts. One moderate study found decreased suicide risk behaviours (Eggert et al., 1995) while a weak study found no significant differences in self-reported suicide attempts (Vieland et al., 1991). Differences in these study findings could be attributed to the different instruments used to measure similar concepts or may have been due to the waning effect of the intervention over the extended 18-month follow-up in the second study. While it could be argued that differences in outcomes may have been due to the much greater intensity and duration of the intervention in the first study, this is partially discounted by the finding of a significant decrease in suicide risk in the group that received only the two-hour assessment (Eggert et al., 1995). Similarly, a dose-response relationship for other outcomes of the curriculum programs was not evident, as increased intensity and/or duration of the intervention did not appear to be associated with more positive outcomes.

Study findings suggested that the curriculum had beneficial effects on the outcomes of potential for suicide, depression, perceived stress, and anger. In general, the curriculum programs also had a positive impact on knowledge related to suicide, although two of five studies found this impact limited. Such improvements in knowledge, however, are relatively unimportant without concomitant changes in actual suicidal behaviour. Four studies found improvements in attitudes related to suicide among some participants. Two studies, however, found negative effects of the curriculum on attitudes, particularly among males. It is not clear from this review if curriculum programs that focus on coping and skills training result in more positive outcomes for participants.

Numerous significant gender differences were found with males more negatively affected than females on the outcomes of coping, hopelessness, and attitudes to
suicide. Generally, females expressed greater satisfaction with the programs than males. It is clear that males and females respond quite differently to school-based suicide prevention programs. It is not known, however, if the specific content of the program impacts more positively on females than on males or if the group or school setting results in more positive outcomes for females. Our understanding of the causes of suicide among males, who are less likely to seek help and more likely to be successful, is incomplete.

Recently, Hazell et al. (1996) examined arguments both for and against teaching suicide prevention, recognizing the trend to mandate such programs in secondary schools. On the positive side, such programs are aimed at students as helpers, not victims, and education may provide the necessary training for students to be able to inform adults about suicidal peers. In the current review, however, one study found that even with the intervention, only 29-40% of students indicated that they would tell an adult about a suicidal peer (Kalafat et al., 1996).

This relatively low proportion raises questions about the efficacy of such programs, although it could be argued that even a modest increase in the percentage of students willing to discuss such issues is important.

On the negative side of the argument for teaching suicide prevention in schools, Hazell et al. (1996) indicated that there is little data regarding the efficacy of such programs. The relatively low rate of completed suicide in the population makes it difficult to establish a genuine reduction in the rate of completed suicide in response to educational programs. Furthermore, they argued that improvements in knowledge and attitudes have been modest. Safety concerns have also been associated with educational programs in terms of deterioration in attitudes among some students, the vulnerability of students who are made to feel responsible for disturbed peers, and the possibility of imitation effects from videos or vignettes used in such programs (Gould et al., 1989; Hazell et al., 1996).

Hazell et al. (1996) also argued that curriculum programs are not efficient, as they involve both direct and indirect costs and yield the most gain in terms of improved knowledge and attitudes for females, rather than males who are at increased risk for suicide. It has been suggested that resources would be better directed towards secondary prevention of males who have made a previous suicide attempt or who are depressed (Shaffer et al., 1988). Hazell et al. (1996) concluded that the data they reviewed did not support the promotion of curriculum based suicide prevention programs for adolescents, a finding consistent with the results of this review. Similarly, the results of this review are consistent with the recommendations of the Canadian Task Force on the Periodic Health Examination which states that there is insufficient evidence to recommend referral of individuals to this intervention (McNamee et al., 1994).

A limitation of this review was that it did not include comprehensive, multi-focused approaches to adolescent suicide that combined prevention, intervention and postvention. Two of the excluded studies used such a comprehensive approach to adolescent suicide, initiating the program at the elementary school level and continuing into secondary school, with a focus on the development of problem-solving skills and positive coping behaviours among students (Angerstein et al., 1991; Zenere et al., 1997). The findings of one of these studies suggest that such a comprehensive, multi-
focused approach that includes a curriculum program as only one component has the potential for significant, positive impact on suicidal behaviours (Zenere et al., 1997).

The use of comprehensive, multi-strategy programs to address high-risk adolescent behaviour has been advocated by a number of experts in the field. Jessor (1991) noted that adolescent risk behaviours are organized into ‘clusters’ with problem behaviours such as alcohol abuse, drug use, delinquency and sexual precocity strongly interrelated with each other. He suggested that the web of causation of such risk behaviours (which would include suicide) is composed of domains that include the social environment, the perceived environment, personality, and biology/genetics. Jessor argued that a comprehensive program that addressed the multiple causative domains of adolescent risk behaviour would yield greater success than a program focused solely on specific behaviours. Dryfoos (1991) reviewed 100 programs that appeared to have potential for changing high-risk adolescent behaviours such as substance use, sexual intercourse and acting out. He identified the following components characteristic of success: (a) multi-component, multi-agency community wide programs; (b) healthy school climate in which students are engaged in the operations of their schools and receive recognition for their contributions; (c) peer involvement in buddy/tutoring or support; (d) parent involvement; (e) social and life skills training; (f) early intervention; and (g) individual attention. An example of these components in action is the comprehensive or ecological school health program (Cameron et al., 1991; Hurrelmann et al., 1995). While the use of such a program involving multi-year, multi-component strategies to address the antecedents of high-risk behaviour has been advocated by some authors (Health Canada, 1994; Kazdin, 1993) and has gained some recognition by public health practitioners, research is needed to demonstrate its impact on the health of adolescents.

CONCLUSIONS

Implications for Practice
The findings of this review suggest that there is currently insufficient evidence to support school-based curriculum suicide prevention programs for adolescents. This finding is consistent with that of other authors who have conducted previous reviews of the available evidence (Hazell et al., 1996; McNamee et al., 1994). There is some preliminary evidence to suggest that comprehensive, multi-strategy approaches may have potential to change high-risk behaviours of adolescents, but further research in this area is necessary.

Implications for Research
Several suggestions for future research arise from this review. One is to develop strategies to achieve at least 80% participation of eligible subjects in the study. Other suggestions are to use data collection instruments with established validity and reliability, and to use the same instruments to permit comparison across studies. Collection of information about possible confounders and control for these at data analysis would also improve the validity of the findings. Increased efforts to determine the short and long-term impact of such programs on actual suicidal behaviours (attempts or completions) are also encouraged. It is important to examine the differential effects of curriculum programs on males and females, and to determine if some types of programs result in more beneficial outcomes for each gender group. Furthermore, research should be conducted on the effectiveness of interventions targeted specifically at males who are at
high risk of suicide. There is also a need to evaluate the impact of comprehensive, multi-strategy programs that are initiated in elementary school and that involve not only prevention but also intervention and postvention. Finally, there is a need for cost analysis of public health interventions such as this to determine the most efficient use of scarce resources.

This overview found that there is insufficient evidence to support school-based curriculum suicide prevention programs for adolescents. The findings indicated mixed results, with both significant and non-significant findings for similar outcomes, and both beneficial and harmful effects for some participants. There were gender differences in response to the programs, with males more likely than females to experience detrimental effects. Finally, there were significant limitations in the quality of the research reviewed.

**Key Messages**

There is insufficient evidence to support school-based curriculum suicide prevention programs for adolescents.

Findings from a review of studies indicated mixed results, with both significant and non-significant findings for similar outcomes, and both beneficial and harmful effects for some participants.

There were gender differences in response to the programs with males more likely than females to experience detrimental effects.

Research on the effectiveness of comprehensive, multi-strategy approaches and on the effectiveness of interventions targeted at high-risk males is necessary.
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<tr>
<th>Study</th>
<th>Design/Quality</th>
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<th>Intervention</th>
<th>Outcomes</th>
<th>Results/Comments</th>
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<tr>
<td>Klingman &amp; Hochdorf, 1993</td>
<td>Controlled</td>
<td>Grade 8 students from low to middle class population. Intervention (n=116);</td>
<td>Psychological education curriculum based on cognitive-behavioural modification principles, stress inoculation; included coping skills acquisition and rehearsal; 12 weekly 50-minute sessions. Intervenor: Experienced school counsellor or psychologist volunteers. Setting: High school.</td>
<td>Significant: • Greater reduction in risk of suicide for intervention group (Index of Potential for Suicide, p&lt;0.05) and for males compared to females (p&lt;0.01) • Improved knowledge of youth suicide and help resources (Knowledge Assessment Instrument, p&lt;0.001) • Improved coping skills awareness (Story Completion, p&lt;0.05) • Greater increased empathy score for females than males (Index of Empathy, p&lt;0.001) • High satisfaction with the program (75% of participants) Non-significant: • Loneliness</td>
<td>Knowledge and story completion instruments developed/adapted by authors.</td>
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<td>Study</td>
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<td>Eggert et al., 1995 (U.S.A.)</td>
<td>Cohort analytic Moderate</td>
<td>Grade 9-12 students from 5 urban high schools; students at risk of high school failure and at suicide-risk: Group I (n=36); Group II (n=34); Group III (n=35).</td>
<td>Group I: Assessment protocol plus 1 semester Personal Growth Class (PGC). Group II: Assessment protocol plus 2 semester PGC. Group III: Assessment protocol only. PGC involved small group work related to social support, life skills training, and monitoring of activities. PGC I classes daily for 55-minute periods over 5 months or 90 class days; PGC II classes daily for 55-minute periods over 10 months or 180 class days. Intervenor: Trained school personnel (teacher, counsellor, school nurse). A trained psycho-social nurse specialist completed the assessments. Setting: High schools.</td>
<td>Significant: • Decreased suicide risk behaviours from pre- to posttest in all 3 groups (Brief Suicide Risk Behaviour Scale, linear trend p&lt;0.001); • Over 85% of youth in Groups I and III decreased suicide behaviours by 25% or more, and 65% of Group II showed similar improvements • Decreased depression from pre- to posttest in all 3 groups (tool adapted from CES-D, linear trend p&lt;0.001); over 65% of the youth in all groups showed 25% or greater drop in depression scores • Decreased hopelessness from pre- to posttest in all 3 groups (3 items, linear trend p&lt;0.001) • Decreased perceived stress from pre- to posttest in all 3 groups (4 items, linear trend p&lt;0.001); 45% of youth in all 3 groups showed 25% or greater reduction • Reduced anger from pre- to posttest in all 3 groups (3 items, linear trend p&lt;0.001); more than 65% youth in Groups I and III compared to 44% in Group II showed at least 25% reduction • Increased personal control from pre- to posttest in Groups I and II (4 items); over 44% of youth in the 2 groups showed improvements.</td>
<td>Assessment only group showed significant improvements pre to posttest in all outcomes except personal control.</td>
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<tr>
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| Kalafat & Elias, 1994 (U.S.A.) | Solomon Four Group Moderate | Grade 10 students from two suburban middle-class schools. Intervention (n=136); versus control (n=117). | Suicide awareness lessons for students; 3 classes of 40-45 minutes over 1 week; Intervenor: Health teachers who had taught suicide awareness classes and who attended 2.5 hour review session. Setting: High schools. | • Increased self-esteem from pre- to posttest in all 3 groups (4-item version of Self-Esteem Scale, linear trend p<0.001) | Non-significant:  
• Change in perceived personal control in Group III  

Significant:  
• Improved knowledge related to suicide (p<0.0001)  
• Improved attitudes related to suicide (p<0.03)  
• Improved responses to suicidal peers (p<0.02)  
Non-significant:  
• No significant gender differences in response to curriculum  

Knowledge, attitude and response to suicide instruments developed/adapted by authors.  
• Students allocated by class.  
• 43% rated classes as helpful, 53% neutral and 3% upsetting; 10% students indicated that they knew someone who was upset a lot by the program.
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<tr>
<td>Kalafat &amp; Gagliano, 1996</td>
<td>Cohort analytic</td>
<td>Grade 8 students from suburban, middle-class school; Caucasian. Intervention (n=52); versus control (n=57).</td>
<td>Participatory small-group discussion classes related to effective coping and mental health services over five regular class periods in five-day period. Intervenor: Consultant from mental health centre. Setting: Middle school.</td>
<td>Significant: • Greater percentage of students in intervention group that would tell adult about suicidal peer (Low and High Ambiguity Vignettes, p&lt;0.001); 40% in treatment group would tell versus 2% in control for vignette #1; 29% in treatment would tell versus 0% in control for vignette #2 • Females expressed greater concern about the situation than males on both vignettes (p&lt;0.001)</td>
<td>• Low and High Ambiguity Vignettes refer to degree of certainty related to suicide risk of peer</td>
</tr>
<tr>
<td>Orbach &amp; Bar-Joseph, 1993</td>
<td>Controlled clinical trial (Moderate)</td>
<td>High school juniors from 6 schools; five middle-class schools; one school with special education classes; Intervention (n=215); versus control (n=178).</td>
<td>Student workshops focused on inner experiences and life difficulties related to suicide; emphasis on coping. 7 weekly 2-hour sessions. Intervenor: School counsellor or psychologist with 7 week training. Setting: High schools.</td>
<td>Significant: • Decreased suicidal tendencies (Israeli Index of Potential Suicide, p&lt;0.05); four of six schools showed decrease in suicidal tendencies; larger decrease in suicidal scores for females than males in two schools • Increased ego identity (Adolescent’s Ego Identity Scale, p&lt;0.05) • More effective coping (Self Control Schedule, p&lt;0.05); two schools showed more effective coping</td>
<td>• Only 6 of 11 principals of initial target schools agreed to participate. • Differences between schools reported in article.</td>
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Table 1: Included Studies
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<th>Study</th>
<th>Design/ Quality</th>
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| Ciffone, 1993 (U.S.A.) | Cohort analytic (Weak) | Sophomore students in three suburban high schools. Intervention (n=203); versus control (n=121). | Day 1: Teacher distributed and reviewed written material on suicide. Day 2: Social worker presented video and structured discussion; 55 minutes. Intervenor: School health teacher and social worker. Setting: High schools. | Significant:  
  • Improved attitudes related to suicide: tell someone about suicidal peer, encourage use of mental health services, talk to others (8 items; p<0.05); males more likely than females to seek help from mental health professional  
 Non-significant:  
  • Decreased number of students who view suicide as possible solution for people who have a lot of problems | Attitude instrument developed/adapted by author. |
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<th>Study</th>
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<tr>
<td>Overholser et al., 1989 (U.S.A)</td>
<td>Cohort pre/post (Weak)</td>
<td>Grade 9 students from 3 suburban middle class schools. Intervention (n=215); versus control (n=256)</td>
<td>Curriculum developed by Samaritans of Rhode Island that focused on suicide-related knowledge and coping skills. Five meetings of health class. Intervenor: School teachers with 2 days training. Setting: High schools.</td>
<td>Significant: • Improved suicide related knowledge for students who knew a peer that had attempted suicide (Suicide Knowledge Test, p&lt;0.01) • Reduced hopelessness for females (Hopelessness Scale for Children, p&lt;0.01) • Increased hopelessness for males (p&lt;0.01) • Improved attitudes related to suicide for females (eight items, p&lt;0.05) • Worsened attitudes related to suicide for males (p&lt;0.05) • Reduced maladaptive coping for females (Kidcope, p&lt;0.01) • Increased maladaptive coping for males (p&lt;0.01) Non-significant: • Knowledge for students who did not know a peer that had attempted suicide</td>
<td>• Attitudes instrument developed by author. • Harmful effects of curriculum for males in hopelessness, attitudes and coping.</td>
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<td>Shaffer et al., 1990, 1991; Vieland et al., 1991 (U.S.A.)</td>
<td>Cohort (Weak)</td>
<td>Grade 9 and 10 students attending 11 suburban and rural high schools. Intervention (n=758); versus control (n=680)</td>
<td>Three curricula programs: 1. Emphasized clinical features of suicidal adolescent to Grade 10 urban minority students; large and small group settings; 4 hours. 2. Emphasized support networks to Grade 9 students; classroom setting; 3 hours. 3. Emphasized problem solving to Grade 9 students; classroom setting; 1.5 hours.</td>
<td>Significant: - 3 of 9 items from knowledge and attitudes about suicide - Higher proportion of students exposed to program who initially said suicide was not a reasonable solution to problems changed mind to indicate it now could be compared with controls (12% vs 8%) especially among males (14% vs 6%) - Improved knowledge of sources of help among intervention than controls (27% vs 22%) - Females rated program more positively than males - Suicide attempters more likely to think talking about suicide in class makes some students more likely to try to kill selves (27% vs 12% in overall sample; 40% vs 14% in males) - Male suicide attempters more likely to know someone who was upset a lot by program (50% vs 1%)</td>
<td>Non-significant: - 6 of 9 items from knowledge and attitudes about suicide - Self reports of first suicide attempt in previous 18 months (2.5% in intervention vs 2.7% in controls)</td>
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| Spirito et al., 1988 (U.S.A.) | Solomon Four Group (Weak) | High school students from 5 schools. Intervention (n=291); versus control (n=182). | Curriculum developed by Samaritans of Rhode Island that focused on suicide-related knowledge and coping skills. 8 hours total over 6 weeks. Intervenor: School teachers with 2 days training. Setting: High schools. | Significant:  
  • Improved suicide related knowledge (Suicide Knowledge Test, p<0.001)  
  • Female students more likely to benefit from curriculum than males in knowledge, attitudes, coping (Kidcope), hopelessness (Hopelessness Scale for Children) and helping behaviours  
  Non-significant:  
  • Main effects for attitudes related to suicide, coping, hopelessness, helping behaviours for suicidal peers | Knowledge, attitudes and helping behaviours instruments developed by authors. |

Notes:

*Studies were categorized as controlled clinical trials if the method of randomization was not described or if the randomization sequence was open to the individuals responsible for recruiting or allocating participants.
REFERENCES


APPENDICES

Appendix 1: Quality Assessment Tool for Quantitative Studies
Appendix 2: Table of Excluded Studies
Appendix 1: Quality Assessment Tool for Quantitative Studies

COMPONENT RATINGS

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

1 Very likely
2 Somewhat likely
3 Not likely
4 Can’t tell

(Q2) What percentage of selected individuals agreed to participate?

1 80 - 100% agreement
2 60 – 79% agreement
3 less than 60% agreement
4 Not applicable
5 Can’t tell

B) STUDY DESIGN

Indicate the study design

1 Randomized controlled trial
2 Controlled clinical trial
3 Cohort analytic (two group pre + post)
4 Case-control
5 Cohort (one group pre + post (before and after))
6 Interrupted time series
7 Other specify ______
8 Can’t tell

Was the study described as randomized?

No Yes

If NO, go to component C

If Yes, was the method of randomization described? (see dictionary)

No Yes

If Yes, was the method appropriate? (see dictionary)

No Yes

RATE THIS SECTION STRONG MODERATE WEAK

See dictionary 1 2 3
C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?
1 Yes
2 No
3 Can’t tell

The following are examples of confounders:
1 Race
2 Sex
3 Marital status / family
4 Age
5 SES (income or class)
6 Education
7 Health status
8 Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?
1 80 – 100%
2 60 – 79%
3 Less than 60%
4 Can’t Tell

RATE THIS SECTION STRONG MODERATE WEAK
See dictionary 1 2 3

D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?
1 Yes
2 No
3 Can’t tell

(Q2) Were the study participants aware of the research question?
1 Yes
2 No
3 Can’t tell

RATE THIS SECTION STRONG MODERATE WEAK
See dictionary 1 2 3

E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?
1 Yes
2 No
3 Can’t tell

(Q2) Were data collection tools shown to be reliable?
1 Yes
2 No
3 Can’t tell

RATE THIS SECTION STRONG MODERATE WEAK
See dictionary 1 2 3
F) WITHDRAWALS AND DROP-OUTS

(Q1) Were withdrawals and drop-outs reported in terms of numbers and reasons per group?
1 Yes
2 No
3 Can’t tell

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).
1 80 - 100%
2 60 - 79%
3 less than 60%
4 Can’t tell

G) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?
1 80 - 100%
2 60 - 79%
3 less than 60%
4 Can’t tell

(Q2) Was the consistency of the intervention measured?
1 Yes
2 No
3 Can’t tell

(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?
1 Yes
2 No
3 Can’t tell

H) ANALYSES

(Q1) Indicate the unit of allocation (circle one)
community organization/institution practice/office provider client

(Q2) Indicate the unit of analysis (circle one)
community organization/institution practice/office provider client

(Q3) Are the statistical methods appropriate for the study design?
1 Yes
2 No
3 Can’t tell

(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?
1 Yes
2 No
3 Can’t tell
### GLOBAL RATING

**COMPONENT RATINGS**

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**GLOBAL RATING FOR THIS PAPER** (circle one):

1. **STRONG** (four STRONG ratings with no WEAK ratings)
2. **MODERATE** (less than four STRONG ratings and one WEAK rating)
3. **WEAK** (two or more WEAK ratings)

**WITH BOTH REVIEWERS DISCUSSING THE RATINGS:**

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

- No
- Yes

If yes, indicate the reason for the discrepancy:

1. Oversight
2. Differences in interpretation of criteria
3. Differences in interpretation of study

**FINAL DECISION OF BOTH REVIEWERS** (circle one):

1. **STRONG**
2. **MODERATE**
3. **WEAK**
## Appendix 2: Table of Excluded Studies

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<th>Study</th>
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<th>Reason(s) for Exclusion</th>
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<tr>
<td>Abbey et al., 1989 (U.S.A.)</td>
<td>Group A: Individual study of handouts related to suicide awareness and potential intervention for 4 weeks; Group B: Individual study as above plus 3 suicide lectures over 2 weeks; Control: Non-suicide related lectures. Intervenor: Course professor. Setting: University.</td>
<td>Participants were college students and not adolescents</td>
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<tr>
<td>Angerstein et al., 1991 (U.S.A)</td>
<td>Multiple approach of prevention, intervention and postvention. Included suicide awareness program for parents, school personnel and students; suicide prevention curriculum; crisis intervention; grief counselling following suicide; guidelines for school personnel related to suicide or crisis. Intervenor: School district psychological social service staff, public school counselors Setting: Primary and secondary school.</td>
<td>Multiple interventions in addition to curriculum program (crisis intervention, postvention)</td>
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<td>Denoncourt, 1994 (Canada)</td>
<td>Information not available</td>
<td>French language article; unpublished</td>
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<tr>
<td>Hazell &amp; Lewin, 1993 (Australia)</td>
<td>Ninety-minute postvention group counselling session for students held within 7 days of suicide of students in each of two schools. Intervenor: Child psychiatrist or trainee. Setting: High school.</td>
<td>Intervention was postvention not curriculum program.</td>
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<td>PetitClerc &amp; Tessier, 1995 (Canada)</td>
<td>Information not available</td>
<td>French language article</td>
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<tr>
<td>Suicide Prevention Program of CUPPL, 1995</td>
<td>Five experiential lessons related to suicide awareness and possible interventions; at least five hours total with each lesson on separate day, spread out over one to several weeks.</td>
<td>Unpublished study.</td>
</tr>
<tr>
<td>(Canada)</td>
<td>Intervenor: School teachers or counsellors.</td>
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<tr>
<td></td>
<td>Setting: High school.</td>
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<tr>
<td>Zenere &amp; Lazarus, 1997</td>
<td>Three-tiered approach of prevention, intervention, and postvention services; this included establishment and adoption of suicide prevention policies and procedures by school board; curriculum related to suicide prevention and general mental health in primary and secondary grades; school-based crisis teams; postvention.</td>
<td>Multiple interventions in addition to curriculum program (crisis teams, postvention).</td>
</tr>
<tr>
<td>(U.S.A.)</td>
<td>Intervenor: Teachers, mental health professionals</td>
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<tr>
<td></td>
<td>Setting: Primary and secondary schools.</td>
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</tbody>
</table>