
Summary Statement Title:

Building on the experiences of past adolescent STI/HIV interventions to optimise future prevention efforts: Evidence and implications for public health

Review Quality Rating: 7 (moderate)

Review on which this summary statement is based:

Sales, J.M., Milhausen, R.R., & DiClemente, R.J. (2006). **A decade in review: Building on the experiences of past adolescent STI/HIV interventions to optimise future prevention efforts.** *Sexually Transmitted Infections*, 82, 431-436.

Review author contact information:

Jessica McDermott Sales, PhD, Rollins School of Public Health, Department of Behavioral Sciences and Health Education, Emory University, 1520 Clifton Road, NE, Rm 132, Atlanta, GA 30322, USA; jmcderm@emory.edu

This is a summary statement written to condense the work of the authors of this systematic review, referenced above. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Review content summary

The goal of this systematic review was to synthesize evidence from adolescent STI/HIV intervention studies conducted in the U.S. between 1994 and 2004. A total of 39 studies of randomized and quasi-randomized design were reviewed. An assessment of efficacy and methodological quality was undertaken. Study findings are presented narratively, based on the intervention venue (e.g. school-based), followed by a discussion of the strengths and weakness across all reviewed studies. Interventions targeted to specific subsets of the adolescent population (e.g. African-American females) appear more effective than general or broad-based interventions that do not acknowledge differences in race, socioeconomic status, gender, etc. Social learning theory and social cognitive theory were the frameworks most consistently used in successful programs. Interventions that addressed psychosocial risk factors had the greatest impact on behavior. Among clinic-based studies, multi-session interventions were more effective than brief interventions. Across venues, the risk behavior most amenable to change was condom use. It was less common for programs to show an effect on increased abstinence or decreased number of sexual partners. Follow-up periods – in some cases as long as three years, but more often 6- or 12-months - demonstrated that positive effects of interventions were significant in the short term but declined in the long term.

Comments on this review's methodology

This is a methodologically moderate review. The review authors searched a variety of electronic databases including: Medline, ERIC, OVID and PsycARTICLES. In addition, reference lists of other published reviews on the topic were reviewed to identify appropriate articles. Clear selection criteria were outlined for study populations and settings. The desired type of study design, however, was not identified. Methodological rigor was assessed based on 13 criteria including: clear description of study site and sample, description of intervention components along with the content provided to the control group, specification of length of follow up, use of blinding procedures to prevent bias, adherence to intention to treat analysis, and a clear description of data analytic techniques. It is not clear if review authors assessed methodological rigor independently. Information pertaining to the intervention program, research methodology, and primary outcomes is presented in tables. Since studies did not consistently report effect size, or failed to provide sufficient statistical information to compute an overall effect size, a qualitative synthesis was performed.

Why this issue is of interest to public health

Since 1997 there has been a gradual but widespread increase in the rates of Chlamydia and gonorrhea plus outbreaks of infectious syphilis and a rise in new HIV diagnoses within Canada.¹ As such, preventive efforts are important given the asymptomatic nature of a number of STIs.^{1,2} Adolescent-focused STI interventions deserve particular attention. Guidelines published by the Public Health Agency of Canada state that an age of 25 years or less is itself considered an STI risk factor.² In Canada, some of the highest rates and increases in STIs are in persons between the ages of 15-24: Chlamydia and gonorrhea are notably more prevalent in women aged 15-24 years, and in men aged 20-29 years.^{2,3} The reported Chlamydia rate in 2004 was highest in persons 15 to 24 years of age, accounting for approximately 2/3 of the national reported cases.² In addition, adolescents are particularly vulnerable to acquisition of Human Papillomavirus (HPV) and both strains of the herpes simplex virus and history of STI infection further increases their HPV risk.² Based on a representative sample of 15- to 19-year-olds, the proportion of this age cohort who had had sexual intercourse at least once declined between 1996/1997 and 2005 (47% down to 43%).⁴ Surprisingly, despite increasing rates of STIs, among those who were sexually active, there was no significant change in the likelihood of having multiple partners or, for males, using condoms.⁴ Review authors acknowledge

that this contradictory evidence may be the result of social desirability bias and/or the fact that condom use data was based on a respondent's most recent sexual encounter and may not reflect his/her typical behaviour.⁴

Evidence and implications

Evidence points are not in order of the strength of the evidence.

What's the evidence?	Implications for practice and policy:
<p>1. School based interventions to prevent STI/ HIV infections among adolescents (13 studies)</p> <p>1.1. More than three quarters of the studies (11 of 13 studies) reported behaviour change (reduction of sexual risk behaviour) among adolescents.</p> <p>1.2. Effective interventions were those that were theory-based, were implemented by trained teachers or health educators, and included a variety of skill and knowledge building didactic and interactive activities</p> <p>1.2.1. The most frequent outcome, reported in 7 studies, was reduced frequency of unprotected sexual intercourse</p> <p>1.2.2. Three studies also reported a delay in initiation of intercourse and/or a decrease in frequency of intercourse</p> <p>1.2.3. One study reported an increase in risk behaviour following participation in the intervention</p> <p>1.3. A major limitation of this review is the absence of effect sizes, and/or confidence intervals or reported levels of statistical significance.</p>	<p>1. School based interventions to prevent STI/ HIV infections among adolescents</p> <p>1.1. If school based interventions are implemented to reduce sexual risk behaviour among adolescents, they should</p> <p>1.1.1. Be theory-based, implemented by trained teachers or health educators, and include a variety of skill and knowledge building didactic and interactive activities.</p> <p>1.2. The data must be interpreted cautiously since the magnitude of effect cannot be estimated based on the data provided in this review. Furthermore, since confidence intervals and/or p values are not provided for each study, it is unclear if statistically significant effects were observed in most studies.</p>
<p>2. Clinic based interventions to prevent STI/ HIV infections among adolescents (12 studies)</p> <p>2.1. 9 of the 12 studies reported behaviour change (reduction of sexual risk behaviour) among adolescents.</p> <p>2.2. Characteristics of effective interventions included a focus on a single gender or ethnic group, HIV/STI education with skill building activities (i.e. condom application), condom negotiation and sexual communication components, and personalised risk assessments</p> <p>2.2.1. 4 studies found an increase in condom use among participants</p> <p>2.2.2. 5 studies found a decrease in sexual initiation or sexual frequency</p> <p>2.3. 4 of the 12 studies reported no significant difference between the intervention compared to a control</p> <p>2.3.1. unsuccessful interventions tended to be single session or have no theoretical framework</p>	<p>2. Clinic based interventions to prevent STI/ HIV infections among adolescents</p> <p>2.1. If clinic based interventions should be implemented to reduce sexual risk behaviour among adolescents, they should</p> <p>2.1.1. Focus on a single gender or ethnic group, include skill building HIV/ STI activities (i.e. condom application), include condom negotiation and sexual communication components, and personalised risk assessments.</p> <p>2.1.2. Have multiple sessions and include a theoretical framework.</p> <p>2.2. The data must be interpreted cautiously since the magnitude of effect cannot be estimated based on the data provided in this review. Furthermore, since confidence intervals and/or p values are not provided for each study, it is unclear if statistically significant effects were observed in most studies.</p>
<p>3. Special population interventions (10 studies)</p> <p>3.1. 6 of 10 studies reported some behaviour change (reduction of sexual risk behaviour) as a result of an intervention in specialised locations including jails and in-patient treatment centres</p> <p>3.2. Successful interventions included a strong theoretical framework, were implemented by trained staff, included a broad content area (e.g. problem solving, capacity building, social skill building, and enhanced gender and ethnic pride), and were delivered using a variety of didactic and interactive teaching methods</p> <p>3.3. 6 of 10 studies reported a reduction in the frequency of unprotected sexual intercourse</p> <p>3.3.1. 3 of the 6 studies found a reduced number of sexual partners</p> <p>3.3.2. 1 of the 6 studies found a reduction in frequency of intercourse</p> <p>3.3.3. 2 of the 10 studies found no behaviour change and 1 study found change in both the intervention and control group</p> <p>3.4. 4 studies reported no change in behaviour</p>	<p>3. Special population interventions</p> <p>3.1. If interventions for special populations are implemented to reduce sexual risk behaviour among adolescents they should</p> <p>3.1.1. Include a strong theoretical framework, be implemented by trained staff, include broad content (e.g. problem solving, capacity building, social skill building, and enhanced gender and ethnic pride) delivered using a variety of didactic and interactive teaching methods.</p> <p>3.2. The data must be interpreted cautiously since the magnitude of effect cannot be estimated based on the data provided in this review. Furthermore, since confidence intervals and/or p values are not provided for each study, it is unclear if statistically significant effects were observed in most studies.</p>

<p>4. Community based interventions (5 studies)</p> <p>4.1. All of the community based interventions reported some behaviour change as a result of participation in the intervention</p> <p>4.2. The most successful community based interventions were theoretically based, tailored to the community, implemented by trained facilitators, addressed diverse content, and delivered using a wide variety of methods</p> <p>4.2.1. 3 studies reported a reduction in the frequency of unprotected sexual intercourse</p> <p>4.2.1.1. one of the 3 studies also reported a reduction in sexual activity</p> <p>4.2.2. one study reported a reduction in the number of sexual partners</p>	<p>4. Community based interventions</p> <p>4.1. If community-based interventions are implemented to reduce sexual risk behaviour among adolescents they</p> <p>4.1.1. Should be theory based, tailored to the target population, implemented by trained facilitators and the content diverse and delivered using a wide variety of methods</p> <p>4.2. The data must be interpreted cautiously since the magnitude of effect cannot be estimated based on the data provided in this review. Furthermore, since confidence intervals and/or p values are not provided for each study, it is unclear if statistically significant effects were observed in most studies.</p>
<p>5. Strengths and limitations of Interventions to prevent STI/ HIV infections among adolescents (39 studies)</p> <p>5.1. Analysis across all interventions in this review found that successful interventions shared a number of characteristics. Interventions that were successful in decreasing high risk behaviour among adolescents:</p> <p>5.1.1. were specifically tailored and delivered to a particular subgroup of adolescents (e.g. African American females)</p> <p>5.1.2. used theory in the development and implementation of the intervention. 9 studies used social learning theory and social cognitive theory incorporating modelling, skill building, and attempts to increase self efficacy with regard to sexual behaviour. 4 studies used information motivation behaviour change theory.</p> <p>5.1.3. went beyond STI education to include an emphasis on psychological correlates of risk. These included problem solving, capacity building, social skill building and enhanced gender and ethnic pride.</p> <p>5.2. The results in this review were inconclusive with regard to intervention duration associated with a reduction of sexual risk behaviour. That is, it is unclear whether a greater number of sessions result in increased behaviour change.</p> <p>5.2.1. Interventions based in clinic settings, intensive multisession interventions were more effective than brief interventions in reducing sexual risk behaviour.</p>	<p>5. Interventions to prevent STI/ HIV infections among adolescents</p> <p>5.1. Interventions that aim to promote behaviour change (reduce sexual risk behaviour) to prevent STI/ HIV infection among adolescents should be:</p> <p>5.1.1. Specifically tailored and delivered to a particular subgroup of adolescents</p> <p>5.1.2. Use theory in intervention development and implementation, especially social learning theory, social cognitive theory, and information motivation behaviour change theory.</p> <p>5.1.3. Go beyond STI education to include an emphasis on problem solving, capacity building, social skill building and emphasize gender and ethnic pride.</p> <p>5.2. Based on the results of this review, optimal intervention duration to reduce sexual risk behaviour is not known. However, in clinic settings, multisession interventions appear to be more effective in reducing sexual risk behaviour, and should be further tested.</p> <p>5.3. The data must be interpreted cautiously since the magnitude of effect cannot be estimated based on the data provided in this review. Furthermore, since confidence intervals and/or p values are not provided for each study, it is unclear if statistically significant effects were observed in most studies.</p>
<p>6. Cost benefit or cost-effectiveness information</p> <p>6.1. No cost related information was included in the review.</p>	<p>6. Cost benefit or cost-effectiveness information</p> <p>6.1. The authors suggest that future research should address cost-effectiveness of HIB?STI prevention programs.</p>
<p>General Implications</p> <ul style="list-style-type: none"> • Interventions to prevent STI/ HIV infections that are based in schools, clinics, the community, and those for special populations show promise in reducing sexual risk behaviour among adolescents • Interventions should be theory based, tailored to a specific population, and should go beyond education (see 5.1.3 above) to include in their delivery • Optimal intervention duration to achieve long-term behaviour change is unknown, however multisession interventions appear to be more effective in clinic settings. • The results of this review should be compared to the results of other rigorous meta-analyses conducted in this topic 	
<p>Legend: CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk **please see the health-evidence.ca glossary of terms (found under 'How to Use This Site') for definitions</p>	

References used to outline issue

1. Patrick, D.M., Wong, T., & Jordan, R.A. (2000). Sexually transmitted infections in Canada: Recent resurgence threatens national goals. *The Canadian Journal of Human Sexuality*, 9(3), 149-165.

2. Public Health Agency of Canada. (2006). *Canadian guidelines on sexually transmitted infections*. Retrieved from http://www.phac-aspc.gc.ca/std-mts/sti_2006/pdf/Guidelines_Eng_complete_06-26-08.pdf
3. Public Health Agency of Canada – Sexual Health and Sexually Transmitted Infections section. (2007). *Sexually transmitted infections* (pamphlet). Retrieved from <http://www.phac-aspc.gc.ca/publicat/std-mts/index-eng.php>
4. Rotermann, M. (2008). Trends in teen sexual behaviour and condom use. *Statistics Canada Health Reports*, 19(3), no. 82-003-XPE. Retrieved from <http://www.statcan.gc.ca/pub/82-003-x/2008003/article/10664-eng.pdf>

Other quality reviews on this topic

- Elwy, A.R., Hart, G.J., Hawkes, S., & Petticrew M. (2002). Effectiveness of interventions to prevent sexually transmitted infections and human immunodeficiency virus in heterosexual men: A systematic review. *Archives of Internal Medicine*, 162(16), 1818-1830.
- Horn, A.K., Rama, S.M., Griffin, T., DeLuca, J.B., Mullins, M.M., Aral S.O., et al. (2007). The efficacy of behavioral interventions in reducing HIV risk sex behaviors and incident sexually transmitted disease in black and Hispanic sexually transmitted disease clinic patients in the United States: A meta-analytic review. *Sexually Transmitted Diseases*, 34(6), 319-332.
- Underhill, K., Montgomery, P., & Operario D. (2007). Sexual abstinence only programmes to prevent HIV infection in high-income countries: Systematic review. *BMJ*, 335(7613), 248-259.
- DiCenso, A., Guyatt, G., Willan, A., & Griffith, L. (2002). Interventions to reduce unintended pregnancies among adolescents: Systematic review of randomised controlled trials. *BMJ*, 324(7351), 1426-1430.

Related links

- Association of Medical Microbiology and Infectious Disease Canada <http://www.ammi.ca/index.php>
- Canada Communicable Disease Report <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/>
- Canadian Guidelines for Sexual Health Education http://www.phac-aspc.gc.ca/publicat/cgshe-ldnemss/cgshe_2e-eng.php
- The College of Family Physicians of Canada. (2007). *Common STIs and tips on prevention*. Available from <http://www.cfpc.ca/local/user/files/%7BCA955980-76FB-45E9-BF43-52FD7BED4198%7D/STIS.pdf>
- Health Canada. Diseases & conditions: Sexually transmitted infections <http://www.hc-sc.gc.ca/hc-ps/dc-ma/sti-its-eng.php>
- The Sex Information and Education Council of Canada http://www.sieccan.org/pdf/sexual_health_gs.pdf
- Society of Obstetricians and Gynaecologists of Canada <http://sexualityandu.ca/professionals/sti.aspx>

Summary statement authors

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