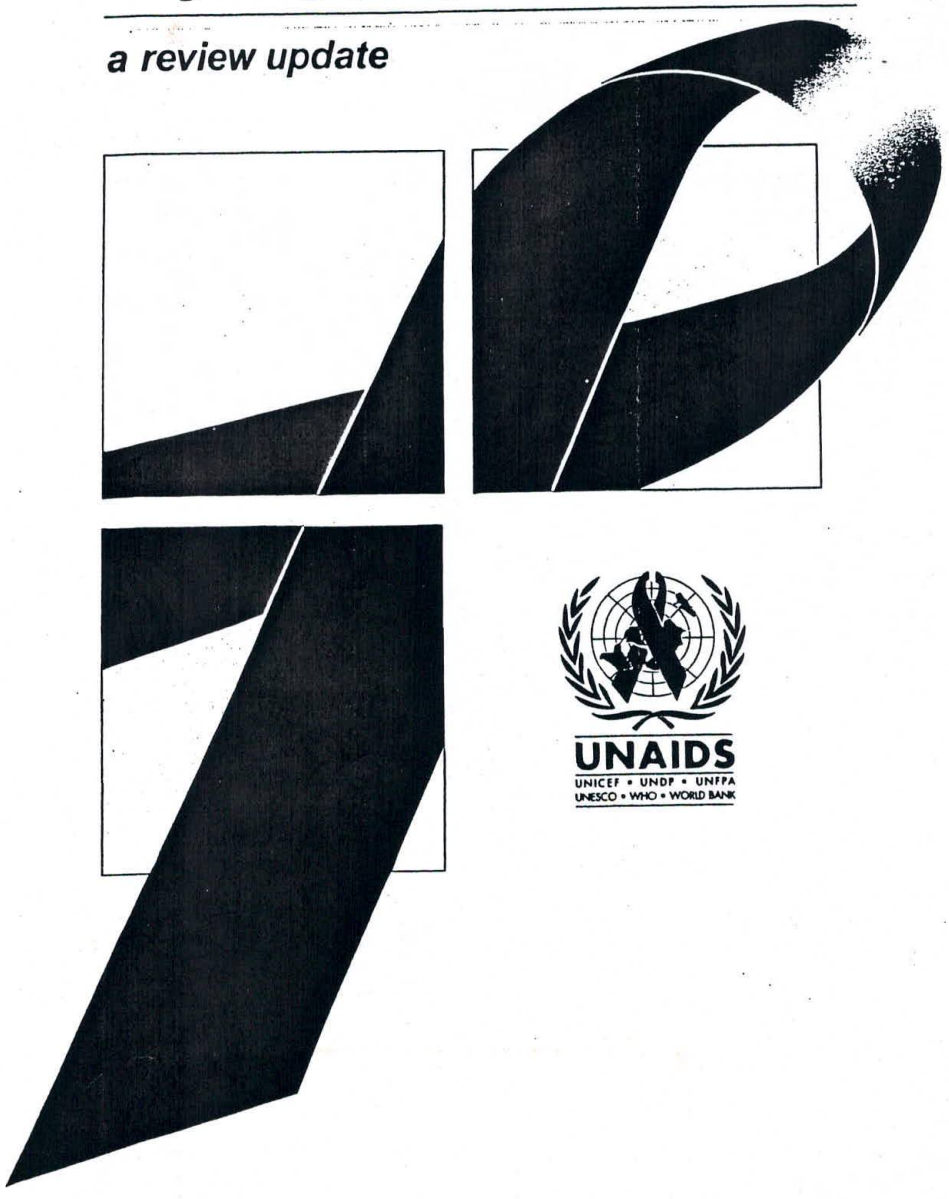
Impact of HIV and sexual health education on the sexual behaviour of young people:

a review update



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Abstract

To assess the effects of HIV/AIDS and sexual health education on young people's sexual behaviour, a comprehensive literature review was commissioned by the Department of Policy, Strategy, and Research of UNAIDS, the Joint United Nations Programme on HIV/AIDS. Sixty-eight reports were reviewed. Of 53 studies that evaluated specific interventions, 27 reported that HIV/AIDS and sexual health education neither increased nor decreased sexual activity and attendant rates of pregnancy and STDs. Twenty-two reported that HIV and/or sexual health education either delayed the onset of sexual activity, reduced the number of sexual partners, or reduced unplanned pregnancy and STD rates. Only three studies found increases in sexual behaviour associated with sexual health education. Hence, little evidence was found to support the contention that sexual health and HIV education promote promiscuity. The interpretative value of this research was somewhat compromised, however, because of inadequacies in study design, analytic techniques, outcome indicators, and reporting of statistics. Future education programmes need to incorporate the features that have been associated with successful interventions in the past, as well as mechanisms by which their impact can be evaluated. Programme evaluation should be grounded in solid study design, and valid and appropriate statistical techniques. Gender and developmental stage of students are issues for the educator and researcher at both the design and the evaluation stages of sexual health/HIV education development.

Introduction

Sexual health education for children and young adults is one of the most hotly debated and emotional issues facing policy makers, national AIDS programme planners, and educators today. Arguments have raged over how explicit education material should be, how much there should be, how often it should be given, and at what age to initiate education. Indeed, the question has been asked: Why educate adolescents about sex, sexual health and sexually transmissible diseases (STDs) at all?

Sexual debut for most young people occurs during their teenage years. Sexual experience among young people has been estimated in a number of countries: At age 15 years, 53% of young people in Greenland, 38% of young people in Denmark (Werdelin, Misfeldt, Melbye & Olsen, 1992), and 69% of young people in Sweden (Klanger, Tyden, & Ruusuvaara, 1993) have experienced intercourse. By age 18/19 years, the percentage that are sexually active has been reported as 54.1% in the United States, 31% in the Dominican Republic (Westhoff, McDermott & Holcomb, 1996), 66.5% in New Zealand (Paul *et al.*, 1995), and 51.6% in Australia (Rodden, Crawford, Kippax & French, 1996). Age of debut has been estimated at a median of 17 years in England (Wellings *et al.*, 1995) and a mean of 15.95 years in the United States (Zelnik & Shah, 1983), and 16.8 years in Sweden (Schwartz, 1993). Therefore, the majority of young people have begun to have sexual intercourse before they leave their teens, and at least half by the age of 16. Use of contraception and STD prevention has been reported to vary across adolescence according to the age at which initiation occurs. Condoms (Kraft, Rise & Træen, 1990) and contraception (Faulkenberry, Vincent, James & Johnson, 1987; Mosher & Bachrach, 1987; Zelnik & Shah, 1983) are more likely to be used the later sex is initiated. Education on these topics has been found to modify that pattern (see Tables 1 to 4), and appears to be more effective if given prior to first intercourse (see, for example, Howard & McCabe, 1990), that is, in adolescence or pre-adolescence.

Partner turnover rate is greater during adolescence and the early twenties than in later years (Billy, Tanfer, Grady & Klepinger, 1993; Paul *et al.*, 1995). This is true not only for numbers of casual partners, but also for those relationships perceived as being regular and monogamous (Rosenthal, Moore & Brumen, 1990). Although these serially monogamous pairings may be of short duration, their regular status, in the minds of many of the young people in them, confers safety with respect to STD transmission (Rosenthal *et al.*, 1990). Unprotected sex is viewed as not risky because the partner is a regular partner as opposed to a casual one. Thus unprotected sex occurs with multiple partners, but the cumulative risk is rendered invisible by the apparent monogamy and commitment of each discrete relationship.

The advent of the HIV/AIDS pandemic has further inflamed the debate. The necessarily frank treatment in education programmes of historically taboo sexual practices (e.g., anal sex, homosexual sexual practice) has rekindled fears as to how young people will respond to the information presented to them. Whereas HIV education and sexual health education for young people clearly have fundamental points at which they diverge (Gillies, 1994), both have been subject to the same criticism, namely, that the discussion of sexual health for purposes other than the promotion of abstinence is an incitement and enticement to precocious sexual involvement (Allgeier & Allgeier, 1988; Nazario, 1992; Scales, 1981; Thomson, 1994; Vincent *et al.*, 1994; Whatley & Trudell, 1993). It is clear that such criticism has had, and will continue to have, a significant effect on the extent and nature of HIV and sexual health education (Scales, 1981; Udry, 1993; Vincent *et al.*, 1994). For this reason a thorough examination of the validity of that contention is essential.

The aim of the current review is not to assess the relative merits of HIV and sexual health education programmes, nor is it to theorize about why some approaches appear more successful than others in reducing the unintended consequences of adolescent sexual activity. Both of those issues have been addressed comprehensively elsewhere; the findings are summarized in the discussion section of this review (Kirby, 1992; Kirby *et al.*, 1994; Kirby, 1995; Mellanby *et al.*, 1992; Oakley, Fullerton & Holland, 1995; Visser & van Bilsen, 1994; Christopher, 1994). This report will complement and extend the previous work by bringing together data collected within and outside the United States, and will go beyond the scope of previous reviews that are restricted to school-based interventions (Kirby, 1995; Kirby, 1992; Kirby *et al.*, 1994; Stout & Rivara, 1989), covering interventions conveyed in tertiary education institutions (e.g., Marcotte & Logan, 1977), clinical settings (e.g., Mansfield, Conroy, Emans & Woods, 1993), by mail distribution (e.g., Kirby, Harvey, Claussenius & Novar, 1989), and through public campaigns (e.g., Herlitz, 1993) and community groups (e.g., Postrado & Nicholson, 1992). The primary intention is to inform policy makers, programme planners, and educators about the impact of HIV and sexual health education on the sexual behaviour of young people as described in the published literature. The review includes:

- a presentation of studies, summarized in Tables 1 to 4;
- a discussion of key findings under each study type (see Methodology for the way the studies were classified);
- conclusions, drawn from the data, about the impact of HIV and sexual health education on the sexual behaviour of young people;
- a general discussion of the methodological problems that have compromised the assessment of this body of literature;
- a discussion of broader issues in education with respect to gender and social context;
- a listing of features of successful programmes;

Methodology

Thirteen literature databases were searched and international experts in the field were consulted to obtain relevant material[1]. Where possible, articles were translated into English. The articles cited in this review are representative rather than exhaustive.

The focus of the review is on research that studied the behavioural impact of HIV/AIDS and sexual health education on young people. Research that dealt solely with knowledge and attitudes about sex has been excluded, because of the poor association between attitudes and knowledge on the one hand, and behaviour on the other (Kirby, 1985b). This also means that only the behavioural outcomes of multifaceted studies are reported. Similarly, studies describing only policy and services, with no behavioural impact analysis, have been excluded. Behavioural outcome is most commonly assessed by comparing people who did or did not receive HIV/AIDS or sexual health education in terms of adolescent pregnancy, abortion and birth rates, STD infection rates, and self-reported sexual activity.

Included in this report are data dating from the mid-1970s, even though some of the research was conducted before the advent of HIV/AIDS. Although the content of sexual health education has changed in the last 20 years, the basic findings from early studies are still relevant with respect to the relationship of sexual health education to sexual behaviour.

The studies considered in this review were classified into four types: controlled intervention studies; other intervention studies; cross-sectional surveys; and national and international comparison studies. The general findings arising from research under these headings will be described, with key studies discussed in detail. Three additional studies whose findings conflict with those of the general corpus of research will be discussed outside that framework.

[1] The databases were: PSYCLIT; SOCIOFILE; APAIS; AUSTROM; MEDLINE; FAMILY RESOURCES; EMBASE; MENTAL HEALTH ABSTRACTS; PASCAL; SOCIAL SCISEARCH; PAIS INTERNATIONAL; DISSERTATION ABSTRACTS ONLINE; CURRENT CONTENTS.

Vincent *et al.* (1987), for example, demonstrated the potential for a dramatic decrease in rates of adolescent pregnancy through the provision of sexual health education and family planning services. The programme was instituted within a portion of a county in South Carolina (USA), with the remainder of the county and three other counties serving as control areas. The intervention involved education for adult leaders, such as community agency professionals, religious leaders, and parents. There were also school-based sexual health education for students from grades K through 12, broadcasting of programme initiatives and messages through the media, and integration of sexual issues into mainstream health promotion. After two to three years of programme implementation, the area in which the intervention was conducted experienced a 35.5/1000 reduction in the estimated pregnancy rate for females 14 through 17 years of age, as compared with 14.4/1000 in the non-intervention area of the target county, and increases of 5.5 ($P<0.002$), 16.4 ($P<0.001$) and 13.9/1000 ($P<0.0001$) in the control counties. The study demonstrated that the effects of sexual health education initiatives may be observed on a scale larger than that of a single school or college class, or institution.

The randomized and controlled design of those intervention studies permits an accurate assessment of the impact of particular sexual health education programmes. Tight control over programme content and the study sample allows valid comparison with the absence of intervention conditions, although one study that reported comparative reductions in birth rates in the treatment group failed to state the statistical significance of the findings (Williams *et al.*, 1985). From those studies it would appear that sexual health education does not lead to greater sexual activity but may lead to safer and more responsible choices for young people.

Other intervention studies

The bulk of the studies of the relation of HIV and sexual health education to sexual activity were non-experimental designs. A total of 38 studies (see Table 2) are grouped in this category. Because of this large number, the text describing study outcomes has been divided into sections on sexual activity and the markers of pregnancy, abortion and births; contraceptive use; and condom use, while the table summarizing the findings has been divided by programme type.

Sexual activity, pregnancy, abortion, and births

Fourteen studies reported reductions in sexual activity, pregnancies, births, or abortions (Dycus & Costner, 1990; Daures *et al.*, 1989; Edwards, Steinman, Arnold & Hakanson, 1980; Howard & McCabe, 1990; Mansfield, Conroy, Emans & Woods, 1993; Mellanby, Phelps, Crichton & Tripp, 1995; Nafsted, 1992; National Committee on Health Education, 1978; St. Pierre, Mark, Kaltreider & Aiken, 1995; Schinke, Blyth, Gilchrist & Burt, 1981; Sellers, McGraw & McKinlay, 1994; Slap, Plotkin, Khalid, Michelman & Forke, 1991;

Contraceptive use

A number of studies have demonstrated increased use of contraception among the sexually active following sexual health education (Berger *et al.*, 1987; Blanchard *et al.*, 1993; Eisen & Zellman, 1987; Herlitz, 1993; Howard & McCabe, 1990; Wielandt & Jeune, 1992; Sakondhavat *et al.*, 1988). Other studies have indicated that although sexual health education does not generally produce an increase in coital activity, such education may lead to increases in alternative and safer practices (in terms of pregnancy or HIV transmission) such as masturbation or oral sex (Dignan *et al.*, 1985; Yarber & Anno, 1981; Zuckerman *et al.*, 1976).

Condom use

Eight recently published studies evaluated education campaigns that focused on HIV/AIDS issues and the promotion of condom use (Blanchard *et al.*, 1993; Goertzel & Bluebond-Langner, 1991; Herlitz, 1993; Kipke *et al.*, 1993; Rotherum-Borus *et al.*, 1991; Siegal *et al.*, 1995; Turner *et al.*, 1993; Wielandt & Jeune, 1992). Four of those reported no change in condom use post-test (Goertzel & Bluebond-Langner, 1991; Kipke *et al.*, 1993; Siegal *et al.*, 1995; Turner *et al.*, 1993), but six (the remaining four plus Jemmott *et al.*, 1992; and Mansfield *et al.*, 1993) reported post-intervention increases in condom use with no accompanying increase in sexual activity or lowering of age of first intercourse. For example, in Switzerland, Blanchard *et al.* (1993) serially surveyed first- through fourth-year apprentices in the Swiss canton of Vaud in 1987, 1990, and 1992 regarding their sexual behaviour, knowledge, and attitudes. Over that five-year period, the young people had been exposed to the Swiss Stop-AIDS campaign, which promoted safer, rather than reduced, sexual activity. From 1987 through 1992 there were dramatic increases in regular condom use, and no lowering of age of first intercourse. Slap *et al.* (1991) reported a decrease from 30% to 24% in condom use among the sexually active from baseline to post-intervention. This was due to the fact that seven baseline condom users were not sexually active at follow-up.

These findings from non-experimental studies demonstrated that education can lead to increases in the extent to which safer sex is practiced but does not necessarily result in more sexual activity. Interpretation of the findings of six studies remains speculative, as details of statistical significance were not provided for observed differences (Dycus & Costner, 1990; Edwards *et al.*, 1980; Marcotte & Logan, 1977; National Committee on Health Education, 1978; Sakondhavat *et al.*, 1988; Schinke *et al.*, 1981).

Cross-sectional surveys

In the nine cross-sectional surveys reviewed, study participants were not assigned randomly to treatment and control conditions, nor were interventions manipulated by the investigators. Rather, respondents were surveyed as to whether they had or had not received sexual health and/or contraceptive education and then

All five of the comparison studies indicated that when and where there was open and liberal policy as well as the provision of sexual health education and related services (e.g., family planning) there were lower pregnancy, birth, abortion, and STD rates. For example, Jones *et al.* (1985) used a 37-country comparison of patterns of adolescent pregnancy to examine the impact of, *inter alia,* government education policy, financial support for abortion and single parents, religiosity, openness about sexual health, ethnicity, and marriage laws, on adolescent pregnancy and sexual activity. Findings from that study indicated that those countries that rated higher on openness about sex were also those that experienced the lowest birthrates; teaching of birth control in schools was associated with low adolescent fertility; and low birth rates were associated with low abortion rates. In a detailed analysis comparing the United States with Canada, England and Wales, Sweden, the Netherlands, and France, the United States was found to have by far the highest rates of adolescent pregnancy, birth, and abortion. Differences in amount of financial support for unmarried mothers, minority issues, and adolescent unemployment did not account for the discrepant birth rates. If discouraging the discussion of sex and access to family planning services in an effort to deter or shield adolescents from sex were effective policies, the United States would have been expected to have one of the lowest adolescent pregnancy rates. Instead, for 1980, 15- through 19-year-olds in the United States had a pregnancy rate of 96/1000 females, over double that of the countries ranked second (England and Wales: 45/1000) and nearly seven times that of the sexually liberal Netherlands (14/1000). Countries that address young people's sexual health in a frank, open, and supportive manner experienced fewer of the negative consequences of sexual activity, yet did not see greater sexual involvement. Jones *et al.* conclude that "increasing the legitimacy and availability of contraception and sexual health education (in its broadest sense) is likely to result in declining adolescent pregnancy rates" (1985, p. 61).

A complementary review by Singh (1986) examined, on a state-by-state basis within the United States, factors linked to variations in adolescent pregnancy. With regard to education about sex, state policy and its implementation varied widely within and between states. Sexual health education was quantified by documenting the proportions of adolescents receiving sexual health education in junior and senior high schools, the amount of class time devoted to that instruction, whether parental consent was required, and the openness of each state's policy towards permitting sexual health education. The only statistically significant finding was an inverse relationship between the proportion of senior high school students receiving sexual health education and pregnancy rates. Unfortunately, this study did not gather direct measures of levels of sexual activity, only pregnancy rates. Therefore, it is not clear whether lower pregnancy rates were due to less sexual activity or more effective contraceptive use.

There is an interesting contrast between the Singh (1986) analysis and the aforementioned analysis by Jones *et al.* (1985). Within the United States a higher abortion rate was correlated inversely with birth rates. The international study, however, found a positive correlation between birth and abortion rates: that

those approaches that advocate abstinence will achieve decreases in sexual involvement or guard against promiscuity. Whatley & Trudell (1993) questioned the validity of two abstinence programmes as comprehensive sexual health education. Criticisms included: insufficient and inaccurate information; reliance on scare tactics; ignoring the realities of adolescents' lives; reinforcing gender stereotypes; lack of respect for economic and cultural diversity; presenting only one side of controversial issues; and inadequate evaluation of programme outcomes. An abstinence-only approach ignores the developmental diversity in young people's sexual health, and marginalizes, and possibly alienates, those who, for whatever reason, do not adopt the "no sex" option. Further, a programme that precludes the discussion of prophylactic measures so as to not undermine the abstinence message misses the opportunity to educate students who will become sexually active in the future.

The third study that reported an association between sexual health education and increased sexual activity was by Marsiglio & Mott (1986). In their sample of 14- through 22-year-olds followed over a five-year period, prior exposure to a sexual health education course was associated positively and significantly with the initiation of sexual intercourse at 15 and 16 years of age, but not at 17 or 18 years of age. As with any other statistical data, correlation does not imply causality, but this result should not be overlooked. The effect of sexual health education, however, was less important (according to the statistical model proposed by the authors) than infrequent church attendance, parental education of less than 12 years, and ethnicity. The authors concluded that "it is unlikely that sexual health education courses will substantially alter teenage [sexual] behaviour" (Marsiglio & Mott, 1986, p. 161).

Goertzel & Bluebond-Langner, 1991; Kipke *et al.*, 1993; Yarber & Anno, 1981). One of the five made only between-group comparisons at pretest and post-test (Bellingham & Gillies, 1993). It is possible for a significant group-by-time interaction to occur without between-group differences at either pretest or post-test. The other four studies evaluated within-group pretest to post-test differences separately for experimental and control groups. Again, important information regarding the interactive effect of time and intervention is lost with such a design. The remaining 16 studies used repeated measures analysis including a group-by-time interaction term, between-group differences in change scores from pretest to post-test, and/or analysis of covariance adjusted for pretest measurements.

Third, drawing conclusions from some studies was difficult because post-test measurements were made so close to programme completion. This is particularly so for courses of short duration (Bellingham & Gillies, 1993; Christopher & Roosa, 1990; Marcotte & Logan, 1977). Post-test measures of behaviour may overlap the time period in which baseline measures were taken, particularly if measures are monthly or yearly averages. At best this masks change and at worst it confounds results. Longer follow-up time allows for sufficient numbers to accumulate that statistical analysis of change may be validly undertaken (Stout & Kirby, 1993). Delayed post-test measurements will also yield information on the durability of change, and assist in the identification of correlates of sustained change.

Fourth, in evaluations that take an experimental approach, the non-randomization of subjects to control and experimental conditions means that results will always be subject to self-selection bias, unless the sampling procedure takes account of this potential confounder (see sampling procedure of Bernard & Schwartz, 1977). Yet the largest group of studies in this review employed non-experimental designs. Oakley *et al.* (1995), in a critical review of the HIV/AIDS prevention literature, questioned the ability of non-randomized controlled studies to address adequately biases introduced in the sample selection process[4].

Finally, when comparing experimental and control groups, researchers should be mindful of the heterogeneity in sexual development of the students that comprise these groups. Evaluation should include some assessment of interactive effects of sexual developmental stage and the intervention. Differences between entire groups only reveal aggregate change, which may veil important differential change in a develop-mentally diverse group. As far as numbers will allow, comparisons should be made between developmentally comparable subjects from the control and experimental groups.

[4] This review should not be read as endorsing randomized controlled designs or any other experimental design over other, non-experimental approaches to evaluation of health promotion interventions. It merely notes that in an experimental approach certain hazards are likely to be encountered depending on the techniques employed. In an area as complex as health promotion, where behaviour and social practices are informed by a variety of information sources and understood within particular discourses, it would be unwise to limit research to any one particular paradigm or to claim that there is only one way to evaluate results.

aims of the programme to an appreciable degree (de Gaston, Jensen, Weed & Tanas, 1994). There is also a diversity of sources of information about sex to which young people either deliberately or inadvertently are exposed. It cannot be assumed that what is taught will be translated directly into behaviour, hence the weak association between sexual knowledge, attitudes, and behaviours.

> "The question is not whether children will get sexual health education, but how and what kind they will receive. It is impossible to hide children from sexual influences. Adult role models, television, advertisements and parents bombard young children with them ... silence and evasiveness are just as powerful teachers as a discussion of the facts" (McNab, 1981, p. 22).

Kirby (1985b) asserted that although the accusation that sexual health education incites sexual activity is unfounded, it is unrealistic and overly optimistic to construe sexual health education as the panacea for unacceptably high rates of adolescent STDs and unintended pregnancy. Sexual health education represents a valuable resource that informs young people's sexual contact but often it is not the most influential, thus the potential of education in the development of behavioural patterns must be assessed in the context of other influences on the sexual health of young people (Goldman & Goldman, 1981; Spanier, 1976; Stout & Rivara, 1989).

Features of successful programmes

Although it may be premature to state that education programmes and provision of clinical services unequivocally reduce STD and unintended pregnancy rates, the evidence here for reductions in their antecedents suggests that such interventions have the potential to achieve those outcomes. This raises the question as to which features of past interventions are associated with reductions in sexual intercourse and in unprotected sexual intercourse. Several researchers have turned their attention to this question, most notably Douglas Kirby and his associates (Kirby, 1992; Kirby *et al.*, 1994; Kirby, 1995). The findings of these three reviews have given rise to a number of identifiable features associated with successful outcomes, which will be briefly described here. The nine features identified in his 1995 review of 50 studies of interventions with young people below the age of 19 years are summarized below, as these support and reflect his earlier findings.

Kirby (1995) found that the following features were common characteristics of programmes that successfully achieved delays in first intercourse, and/or increased the use of contraception or condoms:

1. Social Influence Theory, Social Learning Theory or Cognitive-Behavioural theories of behaviour underpinned the interventions;
2. the programmes were focused on the specific aims of delayed intercourse and protected intercourse;

The social context: gender

The social context of human sexual health has recently been receiving greater attention, particularly in the HIV/AIDS literature (Kippax, Crawford, Waldby & Benton, 1990; Kirby, 1985b; Moore & Rosenthal, 1990; Thomson, 1994). Choosing to have or not to have sex or to use condoms has social meanings, consequences, and implications for public and private identity (Hollway, 1984). In the British *Women, Risk and AIDS Project* (Thomson & Scott, 1991), which studied 500 young women 16 through 21 years of age, the authors examined the perceived appropriateness of the sexual health education the women had received.

> "By far the most common criticism of sexual health education at school was that it had little or no relationship to the real choices and pressures around sexual health that affected the young women in question... the concentration upon the biology of human reproduction was consistently criticised for taking no account of the context in which sexual behaviour takes place nor the personal and social consequences of such behaviour" (Thomson & Scott, 1991, p. 6).

This also highlights the relevance of gender in the delivery of education regarding HIV and sexual health. Male-to-female transmission of HIV, for example, was estimated in one study of sero-discordant couples to be 23% (Padian *et al.*, 1987). In the Masaka district in Uganda, prevalence of HIV in girls aged between 13 and 19 years old is 20 times that of boys in the same age group (*The status and trends of the global HIV/AIDS pandemic*, 1996). Increased risk arises out of not only a physical vulnerability, but also a social one. Often responsibility for contraception and STD protection is located with females. This is so even in the case of condom use, despite their being a male controlled prophylactic. Messages to that effect make use of the stereotype that women are responsible for their own sexual conduct and that of their actual or potential male partners. Women are implicitly asked to step out of their other gender stereotype of passivity and guide the sexual encounter to safety with respect to disease transmission. There is an inherent contradiction in asking women to ensure the use of condoms or discouraging penetrative practices, when their culturally legitimized role in most cultures is one of passivity (Waldby, Kippax & Crawford, 1993). That is, the meanings and assumptions that currently define and inform young women's and young men's sexual lives are often at odds with the strategies proffered by education campaigns (Kippax *et al.*, 1990; Lever, 1995; Thomson & Scott, 1991). This is most notable in steady or regular relationships where, in comparison to casual encounters, condoms are much less likely to be used consistently (Plitcha, Weisman, Nathanson, Ensminger & Robinson, 1992; Rodden *et al.*, 1996).

The importance of gender considerations in formulating and delivering HIV and sexual health education can be found in other studies focusing on practice. The average age difference between females and their first male partners has been estimated at 1.8 years in the United States and 2.3 years in Sweden (Schwartz, 1993); in Norway 83.7% of girls but only 28.4% of boys reported an older partner

Implications for programme planners

Designing high quality programmes is a major challenge for educationalists and policy makers (BMA Foundation for AIDS, 1997), often overwhelmed by the array of data and by pressures from public opinion. This review provides a foundation for policy makers to argue for the continued development of programmes on life skills, HIV and STD, sexual health, and reproductive health. The major points raised are these:

- education on sexual health and/or HIV does not encourage increased sexual activity;
- good quality programmes help delay first intercourse, and protect sexually-active youth from STD, including HIV, and from pregnancy;
- responsible and safe behaviour can be learned;
- sexual health education is best started before the onset of sexual activity;
- education has to be gender sensitive for both boys and girls;
- young people's sexual health is informed by a wide range of sources;
- young people are a developmentally heterogeneous group and not all can be reached by the same techniques.

In addition, studies show that effective education programmes:

- are grounded in Social Learning Theory;
- have focused curricula, giving clear statements about behavioural aims, and feature clear delineation of the risks of unprotected sex and methods to avoid it;
- focus on activities that address social influences;
- teach and allow for practice in communication and negotiation skills;
- encourage openness in communicating about sex;
- equip young people with skills for decoding media messages and their underlying assumptions and ideologies.

The challenge for those who plan for the provision of HIV/sexual health education is to take the discoveries made by researchers and apply them in practice. Programme developers need to resist the temptation to design on the basis of convention and current epidemiological data, and rely rather on evaluated best practice and trend analysis. Grounding HIV/sexual health education in lessons

Conclusion

Influences on young people's sexual lives are not restricted to explicit messages about sex. In pursuit of an appropriate and effective way to promote healthy, positive sexual behaviour, engagement with those influences is vital. It is important that policy makers, programme managers, and teachers be aware that the evidence indicates that safer sexual practice among young people may be achieved through education. Future education programmes need to incorporate the features that have been associated with successful interventions in the past, as well as including their own evaluation procedures. Programme evaluation should be grounded in solid study design and valid and appropriate statistical techniques. The gender and developmental stage of the student are issues for the educator and researcher at both the design and evaluation stages of sexual health/HIV education development. Failing to provide appropriate and timely information and services to young people for fear of condoning and encouraging sexual activity is not a viable option.

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Tables

Study	Intervention	Sample	Key findings for impact on sexual behaviour
Main *et al.* 1994, USA	15 sessions over 1 semester HIV prevention using social cognitive theory on risk behaviour norms, factual knowledge & skills development	$N = 419$ cont. & 560 exp. M & F in 9th through 12th grade	• At 6-month follow-up no difference in initiation of coitus in experimentals (16%) compared to controls (17%: $P = 0.98$), or frequency of intercourse in those active at pretest ($P = 0.533$) • Of those sexually active at pretest, experimental group reported fewer sexual partners in past 2 months compared to controls at post-test ($P = 0.046$)
Smith, 1994, USA	8 sessions incl. self-esteem, STDs communication, decision-making, sexuality in workshops plus sessions using role-playing for skills & negotiation rehearsal	$N = 60$ cont. & 60 exp. M & F, mean age = 15:1 years	• Greater reduction from baseline to immediate follow-up in frequency of intercourse in the last 2 months for experimentals (3.5/month to 1.19/month) than controls (3.95/month to 2.74/month) $P < 0.05$ • Significant increase from baseline to immediate follow-up in contraceptive use due to intervention ($P < 0.005$)
Walter & Vaughan, 1993, USA	6 x 1 period over 2 days AIDS prevention curriculum using health belief, social cognitive & social influence models incl. condom use negotiation & refusal of sex	$N = 577$ cont. & 739 exp. M & F in 9th & 11th grade	• At 3-month follow-up, significant reduction in experimental group compared to controls in sexual intercourse with partners who used drugs intravenously ($P < 0.05$) • Greater monogamy ($P < 0.05$) and consistent condom use ($P < 0.05$) in experimental group compared to controls • No significant difference in changes to rates of abstinence from pretest to post-test ($P = 0.6$)

Study	Intervention	Sample	Key findings for impact on sexual behaviour
ABSTINENCE PROGRAMS			
Christopher & Roosa 1990, USA	6 sessions incl. sex refusal skills, self-esteem, consequences of sex, life goals & family values	*N* = 129 cont. & 191 exp. M & F aged 12 through 13 years	• At immediate post-test there was a significant increase in mean lifetime sexual interaction for those taking the programme (P <0.02), but not for controls • No significant differences in coital behaviour (no P-value given)
Jorgensen *et al.* 1993, USA	6 week abstinence-based pregnancy prevention programme incl. self development, family values, pregnancy & STDs	*N* = 52 cont. & 39 exp. M & F 7th grade	• At 6-month follow-up, for pre-programme virgins there was a marginal difference in initiation of sexual activity in recipients of education (23%) compared to controls (50%) P = 0.051
Miller *et al.*, 1993, USA	Home-based 6 x 20 min. sex education videos discussing puberty, abstinence, gender equality, sexual anatomy, decision-making and refusal-of-sex skills	*N* = 290 cont. & 258 exp. with 7th & 8th grade M & F children in culturally Mormon area	• Follow-up measures taken at 3 and 12 months • Low rates of sexual intercourse overall (3-5%) • Significant increase in sexual interaction over time (P <0.001) for both groups, but no group by time interaction (P = 0.662)

Table 2: Other Intervention Studies: Summary of Study Design, Type of Intervention, and Key Findings *

Study	Intervention	Sample	Key findings for impact on sexual behaviour
HUMAN SEXUALITY COURSES			
Baldwin *et al.* 1990, USA	10 week human sexuality course on STDs/AIDS, contraception through lectures & readings	*N* = 107 cont. & 141 exp. M & F freshman to senior sexually active students	• At immediate post-test, no significant differences in number of vaginal or oral partners for experimental or control groups since the course began ($P > 0.05$) • No significant changes in condom use during vaginal or oral sex for experimental or controls pre- to post-test ($P > 0.05$)
Dignan *et al.* 1985, USA	3 hours x 15 week human sexuality course (no course content details given)	*N* = 103 cont. & 101 exp. M & F sophomore year students	• Significant difference at pretest in levels of premarital intercourse for exp. (67%) compared to control subjects (43%: $P < 0.05$), but no significant changes by immediate post-test • Increase in oral sex in experimental group ($P < 0.05$)
Dycus & Costner 1990, USA	9-week human sexuality curriculum involving parents & school counsellors on HIV, STDs, & decision-making	*N* = 364 M & F aged 12 through 15 years	• A drop in the pregnancy rate from 30 (at pre-programme) to 8 for girls age between 12 & 15 years of age in the first year of the pilot programme (no *P*-value given)
Rees & Zimmerman 1974, USA	Human sexuality on homo-sexuality, family planning, STD, contraception & abortion	*N* = 230 M & F college students	• No increases in percentage sexually active (M at pretest = 79%, at immediate post-test 73%, no *P*-value given; F at pretest 61%, at immediate post-test 62%, no *P*-value given)

* *See end for explanation of abbreviations*

Study	Intervention	Sample	Key findings for impact on sexual behaviour
PUBLIC CAMPAIGNS			
Blanchard *et al.* 1993, Switzerland	Public "Stop AIDS" information campaign carried out in schools, youth centres at social & sporting events over 5 years	*N* = 2911 M & F 16 through 19 years of age	• No significant trends in proportion sexually active over 5 years • Of those sexually active, no increase in number of partners over 5 years (no *P*-value given) • Large increase in regular condom use from 1987 to 1992 (M approximately 22% to 42%; F approximately 10% to 32%,: Statistically significant but no *P*-value specified)
de Fine Olivarius *et al.* 1992, Denmark	Effect of 1985 public campaign promoting barrier methods of contraception and limiting numbers of partners from 1984 to 1988	*N* = 2365 F aged attending STD clinic, mean age = 25.2 years	• No change in total numbers of sexual partners, frequency of intercourse, births, pregnancies, abortions, chlamydia, herpes, and cervical dysplasia ($P > 0.05$) • Over 4-year period, decrease in gonorrhoea from 22% to 6% ($P < 0.01$), but increase in genital warts from 4% to 10% ($P < 0.05$)
Herlitz 1993, Sweden	Effect of 1987 nationwide campaign on AIDS from 1986 to 1989	*N* = 11025 M & F aged between 16 & 44 years	• No statistically significant changes in percentage reporting coital activity or number of sexual partners (no *P*-value given) • Increase in use of condoms among singles with no regular partner (1986: 24% compared to 1989: 35%, no *P*-value given)

Study	Intervention	Sample	Key findings for impact on sexual behaviour
Wielandt & Jeune 1992, Denmark	Pretest prior to 1985 public information of HIV/AIDS from 1984 to 1989	*N* = 1381 M & F aged 16-20 years	• No difference in age profiles for first coitus in 1984 & 1989 (median age F: 1984 = 16.7 years, 1989 = 16.8 years; M = 16.9 years in both 1984 & 1989) • From 1984 to 1989 more condoms used for first coitus: M = 36.5% to 61% (P <0.001); F = 42.1% to 62% (P <0.001)
ABSTINENCE PROGRAMS			
St. Pierre *et al.* 1995, USA	12 sessions over 3 months, booster programme at 1 & 2 years (for only half of experimental group), on resistance, skills, peer pressure, abstinence promotion using role-playing & advertisement analysis	*N* = 53 cont. & 99 exp. M & F, mean age = 13.6 years	• No significant differences in exp. & cont. pretest virgins in initiation of intercourse, or subsequent frequency & time since last intercourse at immediate, 1 year & 2 years post-test • Reduction in pre-programme non-virgins in frequency & time since last sexual intercourse at 1 year (P <0.1), & 2 years (P <0.05) post-test compared to cont. & exp. subjects who also completed booster programme
Young *et al.* 1992 USA	24 sessions on self-esteem, puberty, sexual decision-making, parent-child communication, abstinence promotion	*N* = 66 cont. & 60 exp. M & F junior high school students (N.A.S)	• At 1 week post-test, 6 exp. & 3 cont. who had had intercourse in last month at baseline, had not had intercourse in last month, and 0 exp. & 3 cont. who had not had intercourse at baseline in the last month, had had intercourse in the last month (P <0.001)

Study	Intervention	Sample	Key findings for impact on sexual behaviour
Marcotte & Logan 1977, USA	3-day medical sex education course incl. sex role socialization, physiology, cross-cultural comparison of sexuality & sexual health	*N* = 41 M & F medical students mean age = 24.9 years	• 70.9% at pretest and 75.6% at immediate post-test had sexual intercourse regularly (no *P*-value given) • Frequency of intercourse: 9.4/month at pretest and 9.7/month at post-test (no *P*-value given)
Mellanby *et al.* 1995, UK	25-30 x 1 hour education by doctors, teachers & peers on puberty, reproduction, contraception, relationships, assertiveness training through role play & group work	*N* = 5398 cont. & 1175 exp. M & F, 15 through 16 years	• After approximately one year post-intervention, controls were 1.45 (95% CI: 1.13 – 1.87) times more likely than programme students to be sexually active at 15.5 to 16.5 years of age
Postrado & Nicholson 1992, USA	(I) 6 x 2 hours on pregnancy prevention, peer pressure, resistance skills, assertiveness by discussion & films, & (II) 5 x 2 hours with parent on parent-child communication about sex	*N* = 117 cont. & 295 exp. F, 12 through 14 years	• At 1-year follow-up, pretest virgins doing component I just as likely to initiate sex as non-participants (OR: 1.0, *P* = 0.974) • For component II, at 1-year follow-up pretest virgin non-participants marginally more likely to initiate intercourse than participants (OR: 2.6, *P* = 0.054)
Sakondhavat *et al.* 1988, Thailand	Sex education including abortion, contraceptive information, STDs	*N* = 520 M & F attending vocational school, mean age = 20.6 years	• After 1 year, no increase in sexual activity (no *P*-value given) • Increase in contraceptive use (no *P*-value given)

Study	Intervention	Sample	Key findings for impact on sexual behaviour
Schinke *et al.* 1981, USA	Cognitive behavioural prevention with social worker on reproduction, contraception, problem solving, decision making & interpersonal skills (no information on course length)	*N* = 49 cont. & 44 exp. M & F adolescents (no age specified)	• Reduction in intercourse without contraception in treatment compared to controls at 6-month follow-up (Group 1: 5% versus 23%, Group 2: 7% versus 31%), at 9-month follow-up (Group 1: 8% versus 26%, Group 2: 11% versus 42%) & at 12 months follow-up (Group 1: 6% versus 30%, Group 2: 11% versus 41%) (no *P*-values reported)
Siegal *et al.* 1995, USA	12 sessions in 3 weeks on HIV, skills to refuse sex, decision-making, sex education	*N* = 123 cont. & 434 exp. M & F 7th, 8th & 9th grade	• No significant difference in changes in sexual risk-taking (i.e., number of partners, frequency of sex, & condom use) from pretest to 3-month follow-up post-test between experimental and control groups (no *P*-value given)
Turner *et al.* 1993, USA	3 to 5 week college seminars on STDs, safer sex, values, decision-making & assertiveness skills	*N* = 227 cont. & 341 exp. M & F mean age = 18.3 years	• At 3-month follow-up, greater abstinence in experimental males at post-test (42%) compared to pretest (25%: $P < 0.05$) and compared to control group at post-test (29%: $P < 0.05$), but not for females • No significant differences in number of partners between pretest & post-test, or between experimental & control groups

Study	Intervention	Sample	Key findings for impact on sexual behaviour
Mansfield *et al.* 1993, USA	Physician intervention: Cont.: standard HIV counselling on risk assessment, condom use & supply of free condoms; extra intervention incl. 20 minutes discussion on HIV infection susceptibility, prevention, HIV testing	*N* = 43 standard & 47 extra intervention M & F, mean age = 17.6 years	• At 2 month follow-up, no significant differences between standard & extra intervention groups in sexual behaviour or condom use • From baseline to 2-month follow-up, 0.4 reduction in number of partners in last month (P <0.0001), and increase in condom use always from 13% to 23% (P <0.001) for both intervention groups combined
Rotherum-Borus *et al.* 1991, USA	3-30 x 90-120 minutes on HIV knowledge, coping in risk situations, skills identification through videos & discussion	*N* = 67 cont. & 78 exp. M & F runaways aged 11 through 18 years	• Rates of abstinence in past 3 months was the same for experimental & control groups at 3-month & 6-month follow-ups • As number of sessions increased, so did consistent condom use at 3-month ($\beta = 0.3$, P <0.06) & 6-month follow-up ($\beta = 0.25$, P <0.06)
Slap *et al.* 1991, USA	1 peer-counselling session (5-30 minutes) on HIV transmission, condom use, risk behaviours, abstinence, HIV testing & contraception	*N* = 241 F at adolescent clinic aged 12 through 19 years	• Significant decrease in reporting of sexual intercourse in last 2 weeks from pretest (21.3%) to 2-6 week follow-up (13.7%: P <0.05) • Decline in condom use always from pretest (30%) to post-test (24%: P <0.05)

Table 3: Cross-Sectional Surveys: Summary of Study Design, Type of Survey, and Key Findings *

Study	Intervention	Sample	Key findings for impact on sexual behaviour
Anderson *et al.* 1990, USA	Survey about HIV/AIDS education in schools	N = 8098 M & F between 9th and 12th grade	• Once HIV/AIDS knowledge, gender, race & age were taken into account, HIV/AIDS education had no effect on having ≥ 2 sexual partners over lifetime and/or in last year, or on always using condoms (P <0.05)
Dawson 1986, USA	Retrospective survey on receiving education on menstruation, STD, birth control, reproduction, & sexual behaviour	N = 1888 F aged 15 through 19 years	• No effect on probability of initiation of sexual activity (no P-value given) • Education recipients more likely to use contraception: Ever: (P <0.05) & at first intercourse (if education is given prior to initiation) (P <0.05)
Furstenberg *et al.* 1985, USA	Retrospective survey of sex education & sexual behaviour	N = 469 M & F 15 through 16 years of age	• Prevalence of intercourse significantly higher in those who did not have sex education (25.5%) compared to those who did (16.5%: P <0.05)
Ku *et al.* 1992, USA	Evaluated formal education in AIDS, birth control, STDs & resisting sexual activity	N = 1,880 M 15 through 19 years of age	• HIV/AIDS education was associated with a marginal increase in the number of those who had no partners in the past year (4%: P <0.1), & 9% increase in proportion using a condom 100% of the time (P <0.01)

* *See end for explanation of abbreviations*

Study	Intervention	Sample	Key findings for impact on sexual behaviour
Spanier 1978, USA	Retrospective survey on attendance at a sex education course at either junior or senior high school, & sexual behaviour	*N* = 1177 M & F college students	• No relationship between attending a sex education course in junior or senior high and subsequent premarital sex behaviour ($\chi^2 = 6.3$, df = 4: NS) • No relationship of birth control instruction to subsequent premarital sexual behaviour (F: $\chi^2 = 2.2$, df = 4:NS; M: $\chi^2 = 4.4$, df = 4:NS)
Wellings *et al.* 1995, UK	Retrospective national survey of sexual attitudes & lifestyles	*N* = 18876 M & F aged 16 through 59 years	• M whose main source of sex education was school-based were significantly more likely to be virgins at 16 years compared to those whose main source was friends ($P < 0.05$). This relationship was non-significant for F ($P > 0.05$) • M & F significantly more likely to use contraception ($P < 0.05$) & F more likely to use condom at first intercourse ($P < 0.05$; M: NS, $P > 0.05$) if school was main source of sexuality information compared to friends as main source

M = males, F = females, cont. = control subjects, exp. = experimental subjects

Study	Type of article	Sample	Key findings for impact on sexual behaviour
Siedlecky 1987, Australia	Commentary on issues for young people's sexuality		• Even though there has been an increase in the number of school programmes on sexuality education there has not been a concomitant increase in adolescent pregnancies & births
Singh 1986, USA	Interstate comparison within the United States of sex education, abortion, pregnancy & birth rates	F 15 through 19 years of age	• A higher proportion of white senior high school students receiving sex education was associated highly with lower pregnancy rates in white but not black females (standardised $\beta = -0.98$: $P < 0.01$) • No significant relationship between sex education & abortion rates ($P > 0.05$)