

School sex education: an experimental programme with educational and medical benefit

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Abstract

Objectives—To develop and teach a school sex education programme that will lead to a decrease in sexual activity.

Design—A matched internal and external control experiment, comparing control populations which received their own sex education programmes with populations which received a novel sex education intervention that included medical and peer led teaching.

Setting—Comprehensive secondary schools; control and intervention populations within Devon, and distant controls from rural, semiurban, and urban areas of England excluding major conurbations.

Subjects—Schoolchildren were taught from age 12 to 16; three successive cohorts of students were evaluated in school year 11 (mean age 16.0).

Main outcome measures—Questionnaire conducted under “examination conditions” and invigilated by the research team and other trained medical staff.

Results—In the intervention population, progressive increase in knowledge related to contraception, sexually transmitted diseases, and prevalence of sexual activity (χ^2 (trend) $P < 0.001$ for all three series); relative increase between intervention and control populations in knowledge, relative decrease in attitudes suggesting that sexual intercourse is of itself beneficial to teenagers and their relationships, relative decrease in sexual activity, and relative increase in approval of their “sex education” (relative risk > 1.00 with 95% confidence limits not including 1.00 for all series and for comparisons with both control populations); odds ratio (control *v* programme) for sexual activity of 1.45, controlling for sociodemographic variables.

Conclusion—School sex education that includes specific targeted methods with the direct use of medical staff and peers can produce behavioural changes that lead to health benefit.

Introduction

Medical problems associated with young teenagers' sexual behaviour are a major health burden—nearly a third of women become pregnant before age 20, and there are around 40 000 abortions among teenagers each year.¹ Problems are not confined to pregnancy and include secondary infertility² and development of cervical abnormalities in younger age groups.³

Young teenagers, despite increased sexual knowledge, are poor contraceptive users.^{4,5} Neither specific teaching about contraception nor improving the contraceptive service consistently increase effective contraceptive use by young teenagers.^{6,7} Teenagers having sexual intercourse before age 16 are more likely to take risks.⁸ They have more sexual partners during their lifetime and more partners per year and they start sexual activity earlier in new relationships than those who become sexually active after age 16, and they express more regret over their actions.^{9,10} These findings suggest that postponement of first intercourse

would be likely to have medical and social benefit.

Health interventions in schools in Britain have shown little success in changing behaviour even when they use methods that are successful in North America.¹¹ The few American sex education programmes associated with sustained changes in sexual behaviour have used methodologies derived from social learning theory.^{12,13,17} The basic principles of education have been seen as conflicting with medical aims to change behaviour,¹⁴ and there is an incorrect belief that medical involvement in health education depends on authoritarian instruction,¹⁵ a principle that has been tried but seems ineffective.¹⁶

We report a controlled experimental implementation of a sex education programme evaluated in terms of knowledge gain, attitude and behaviour change, and acceptability. Doctors and teachers have worked closely together to develop and deliver the programme.

Methods

The experimental programme consisted of 25-30 one hour lessons delivered to secondary school students, mostly in national curriculum years 9 (13-14 years) and 10 (14-15), and evaluated in year 11 (15-16). The programme team, a doctor (AM) and a senior teacher (FP), directly taught six lessons, provided training and support for the schools' own teachers in delivering part of the intervention (15-20 lessons), and trained and supervised peer leaders (four sessions).

The content incorporated strategies identified as potentially successful from a review of health education literature and projects.¹⁸ Subjects covered included puberty, reproduction, contraception, and negotiation in relationships, including training in assertiveness skills. The emphasis on avoidance of risks came not from instruction but from “empowered” personal choice gained through involving students in role play and group work. The programme did not represent an increase in schools' total time allocated to this subject area. Absenteeism in years 9 and 10 was 5%. One pupil was withdrawn from school sex education by the parents.

Local schools were matched, after discussions with the local education authority and head teachers, and allocated to the programme group or local control group to provide similar population sizes with logistic feasibility of delivering the programme (transport between schools). The reliability of the match was confirmed by questionnaire trials and baseline data before teaching.

Outcome was evaluated with a questionnaire given to students in March and April of year 11 (age 15-16 years), and three years of data are presented here. Within the programme schools the three cohorts of students received none (1992), some (1993), or all (1994) of the intervention and their responses provide baseline and longitudinal school data. In control schools the students continued to receive the existing sex education without intervention from the research team. To examine for “cross contamination” between programme and local control schools and for effects of repeated questionnaire use in schools, a “distant”

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TABLE I—Size of programme and control cohorts

	1992	1993	1994
No of schools:			
Programme	2	2	2
Controls:			
Local	4	5	5
Distant	2	6	20
No of students:			
Programme	435	353	387
Controls:			
Local	435	483	455
Distant	317	852	2856

control group, drawn from similar social and population areas outside the south west, was assembled; this increased annually (table I).

Each questionnaire session was conducted by trained medical staff under "examination" conditions. Absenteeism in programme and control schools when the questionnaire was administered was 14%, and parental withdrawal was less than 1%. The outcome measures were changes in attitudes, knowledge of risk factors, and age at first intercourse. Sexual activity was determined from answers to a series of questions on physical involvement in relationships. Evidence from random direct personal questioning and questioning one year later supported the reliability of this methodology.¹⁹ Data are also given for teenagers' interpre-

tation of prevalence of sexual activity among their friends. The questionnaire recorded sociodemographic variables known to be associated with the age at sexual intercourse among teenagers (table II).^{9,10}

Internal reliability of the questionnaire was assessed by identifying inconsistent answers (for example, 4% answering they had no older siblings subsequently responded to questions about older siblings) and by repetitive position marking throughout question banks. There were no significant differences between programme and controls students on these criteria or missing questionnaire data.

Statistical analysis was carried out with SPSS(PC) software. In two by two tables programme effects are expressed as relative risks with 95% confidence intervals. Where more than one question has been analysed the χ^2 for trend (Mantel extension) was calculated and probability figures given. Multivariate analysis was performed with a logistic regression model to assess programme effects allowing for other influential variables.

TABLE II—Characteristics of students in sex education programme and controls. Values are numbers (percentages)

	Programme (n=1175)	Controls	
		Local (n=1373)	Distant (n=4025)
Sex:			
Male	591 (50.3)	691 (50.3)	2084 (51.8)
Female	584 (49.7)	682 (49.7)	1941 (48.2)
Education and employment intentions†:			
University	330 (28.1)	366 (26.7)	1070 (26.6)
College	862 (73.4)	1007 (73.3)	3122 (77.6)*
Training course	192 (16.3)	211 (15.4)	573 (14.2)
Job arranged	147 (12.5)	156 (11.4)	390 (9.7)*
0-4 GCSEs‡	95 (8.1)	63 (4.6)*	120 (3.0)*
Parental social class‡:			
Non-manual	754 (68.2)	832 (65.2)	2562 (67.0)
Manual	352 (31.8)	445 (34.8)	1263 (33.0)
Residence‡:			
Rural	408 (35.0)	367 (27.0)*	1999 (49.9)*
Urban	758 (65.0)	994 (73.0)*	2007 (50.1)*
Religion	178 (15.1)	255 (18.6)*	555 (13.8)

*P < 0.05 compared with programme group.
 †Some respondents gave more than one reply.
 ‡Inadequate parental information supplied by 6% of respondents.
 §General certificate of secondary education subjects; examination taken at age 15-16.
 ||Those answering yes to "I am a religious person."

TABLE III—Percentage (number) of correct answers to factual questions

	1992	1993	1994
Contraception:			
Programme	54.4 (1184/2175)	65.3 (1153/1765)	69.0 (1336/1935)
Controls:			
Local	56.6 (1231/2175)	57.6 (1391/2415)	56.0 (1273/2275)
Distant	59.9 (950/1585)	62.7 (2670/4260)	58.5 (8357/14280)
Sexually transmitted diseases:			
Programme	33.5 (728/2175)	54.3 (959/1765)	60.4 (1169/1935)
Controls:			
Local	34.3 (747/2175)	35.5 (858/2415)	36.6 (832/2275)
Distant	32.3 (512/1585)	37.5 (1599/4260)	35.3 (5035/14280)

For statistical analysis each group of five questions was treated as one unit.
 * χ^2 (trend) P < 0.001 for increasing proportion of correct answers for both series in the programme schools.
 †Greater proportion of correct answers than local controls (relative risk 1.23; 1.11 to 1.37) and distant controls (1.18; 1.10 to 1.27).
 ‡Greater proportion of correct answers than local controls (relative risk 1.66; 1.43 to 1.92) and distant controls (1.71; 1.56 to 1.89).

TABLE IV—Differences in students' attitudes after sex education programme and in control populations. Values are numbers (percentages) of respondents disagreeing with all statements

School group	1992	1993	1994
Sexual intercourse will:			
Makes boys more attractive to girls			
Programme	113 (26.0)	99 (28.0)	121 (31.3)*
Controls:			
Local	107 (24.6)	110 (22.8)	101 (22.2)
Distant	73 (23.0)	170 (20.0)	628 (22.0)
Make girls more attractive to boys			
Make relationships last longer			
Make teenagers feel more "grown up"			
Sexual intercourse will:			
Give teenager girls a bad reputation			
Programme	152 (34.9)	137 (38.8)	185 (47.8)†
Controls:			
Local	153 (35.2)	182 (37.7)	171 (37.6)
Distant	110 (34.7)	295 (34.6)	991 (34.7)

*Relative risk 1.41 (95% confidence interval 1.12 to 1.77) for programme group v local controls; 1.42 (1.21 to 1.67) for programme group v distant controls in 1994.
 †Relative risk 1.27 (1.09 to 1.49) for programme groups v local controls; 1.38 (1.23 to 1.55) for programme group v distant controls in 1994.

Results

The percentage of correct answers to five questions about contraception and five about awareness of risks of sexually transmitted diseases in successive cohorts from the programme schools increased from baseline in 1992 and was higher than from control students in 1994 (table III). Questions asked included, for example, whether oral postcoital contraception was effective two days after sexual intercourse; correct answers to this question increased in programme populations from 33% in 1992 to 70% in 1994 and were 22% higher than in the control populations in 1994 (relative risk 1.47; 95% confidence interval 1.37 to 1.59). Other questions asked teenagers about prevalence of diseases and sexual activity. The percentage of programme students who incorrectly believed that "more than half of all teenagers have had sexual intercourse before they are 16" fell from 59% in 1992 to 46% in 1994 (χ^2 for trend P < 0.001) and was 14% lower than the overall control population in 1994 (0.77; 0.69 to 0.86). Programme and control schools had prior access to the questionnaires and were given annual reports comparing their students' answers with those in other control schools. Within control populations there was no annual increase in correct answers, nor was there a difference in control schools tested for more than one year compared with those newly recruited each year.

Students were asked for responses to six statements suggesting that sexual intercourse was beneficial to teenagers and their relationships. Table IV gives percentages of students disagreeing with all statements for programme and control groups. In 1994 a greater proportion of students from the programme schools disagreed with all statements than those from either control school groups. In particular, 86% of the programme group, compared with 71% of the local control group, disagreed that sexual intercourse made relationships last longer (1.22; 1.13 to 1.31) and 49% v 39% disagreed that girls get a bad reputation if they have sexual intercourse (1.27; 1.09 to 1.48).

Table V gives the results for sexual activity for programme and control populations between 1992 and 1994. In successive years, the percentage of local control students, but not programme students, who had had sexual intercourse increased. Overall there was a significant difference between programme and both local and distant control populations in 1994. As increased educational aspirations, religiosity, fewer older siblings, and rural residence are associated with a decreased likelihood of sexual activity at 15-16 years^{9,10} we performed a logistic regression analysis, allowing

TABLE v—Number (percentage) of sexually active teenagers aged 15.5-16.5 years

	1992	1993	1994
Overall:			
Programme	187 (44.1)	159 (45.7)	162 (42.1)
Controls:			
Local	197 (45.7)	246 (51.3)	239 (52.9)
Distant	143 (45.4)	401 (47.3)	1358 (47.8)
Teenage boys:			
Programme	97 (44.5)	70 (41.4)	73 (38.0)
Controls:			
Local	107 (48.4)	120 (52.2)	121 (52.2)
Distant	72 (44.7)	206 (47.8)	662 (44.9)
Teenage girls:			
Programme	90 (43.7)	89 (49.7)	89 (46.1)
Controls:			
Local	90 (42.9)	126 (50.4)	118 (53.6)
Distant	71 (46.1)	195 (46.9)	696 (50.9)

1992 to 1994 χ^2 (trend) for increasing proportion of sexually active students in local control population: overall $P=0.03$, girls $P=0.03$, boys not significant. Not significant for any of the programme or other control groups.

1994 Overall programme population less sexually active than local control population (relative risk 0.80, 95% confidence interval 0.69 to 0.92) and for other controls (0.88; 0.78 to 0.99).

for these factors. This indicated that students in 1994 in the whole control population were 1.45 times more likely to have had sexual intercourse than students within the programme population (odds ratio 1.45; 1.13 to 1.87).

Students were asked whether they believed that their friends had had sexual intercourse. Responses indicated a decreasing percentage of "close" friends who respondents believed were sexually active in the programme population, for female friends from 46.1% in 1992 to 38.5% in 1994 and for male friends from 44.7% to 36.1%. In 1994 the proportion of friends believed to be sexually active was lower in the programme group than in the control populations (difference 8.1% (3.4% to 12.7%) for female friends, 7.0% (1.8% to 12.2%) for male friends). Eighty per cent of respondents answered that most of their close friends came from their own school.

Throughout the programme teachers, parents, school governors, and students were canvassed for views about the project and gave overwhelming support. Within the year 11 questionnaire we asked for students' opinions on sex education and how it might be improved. In 1992, 40% of programme and control populations answered that sex education was "OK as it is." In 1994 the proportion of the programme students giving this answer increased to 74% (χ^2 (trend) $P<0.001$) but remained nearly the same in the control schools (44%; relative risk, programme *v* control, 1.66; 1.54 to 1.78). Students were asked if "outsiders" should be used more often. The percentage remained at over 74% for 1992 to 1994 in both programme and control schools, programme schools having received "outsiders" in 1993 and 1994.

Discussion

Within a broad based sex education programme receiving support from education and health authori-

ties, school teachers, governing bodies, and students, we detected changes in attitude, increases in knowledge, and a relative decrease in sexual activity compared with control populations. The attitude changes included a decrease in students' beliefs that teenagers, especially girls, obtain a "bad reputation" if they are sexually active. We consider this an indicator of increased tolerance, one main educational objective of the project. Data on sexual activity cannot be tested absolutely. Programme students might give "acceptable" responses reflecting their perceptions of "desired" behaviour. The lack of proscription in our teaching and the attitude changes suggesting a diminished stigmatisation of sexually active teenagers may make this unlikely. The nine month interval between teaching and testing, collaborative information about friends' sexual activity, and methodology used to define sexual activity¹⁹ should strengthen the reliability of the data. More information will accrue from data on contacts with health services on matters related to sex. This is being collected but several more years will be needed to achieve a sufficient sample for analysis.

An examination of the literature and a programme review¹⁸ suggested that applying principles of social learning theory in health education (so that students learn, do role play, and observe their effectiveness in controlling relationships) rather than more traditional educational methods of didactic teaching or large group "theatre" type productions, were more likely to be associated with behavioural change. Other health education programmes, smoking prevention for example,²⁰ have suggested that knowledge, even about risk, is largely irrelevant to teenagers' behaviour. We found that the level of teenagers' understanding of human sexuality limited their ability to make informed decisions. For example, over a quarter thought that the middle of the menstrual cycle equated with the "safe period." We therefore continued to include a considerable factual content in this programme but delivered the information by using group work and group discussion.

Having a doctor present in the lessons helped in giving accurate information about medical issues but teachers controlled the process of delivery. Peer led sessions (adapted from Howard's programme, which showed postponement of first intercourse in the United States¹²) are delivered by slightly older and trained teenagers²¹ and include learning and practising assertive skills. We consider that including all these components has produced an effective and acceptable programme.

Direct involvement of the medical profession in school education is expensive, but support for this programme results in part from this involvement. Parents and schools have been reassured by medical commitment to the programme and this has contributed to a low level of student withdrawal. Teachers have found access to current information about topics such as contraception or HIV useful, since opinions are changing and information is often available only in medical journals. The students' approbation is especially noteworthy, and perhaps adults will be reassured that teenagers involved in a project associated with a reduction in sexual activity are nearly twice as likely to consider their sex education to be "ok" than control populations with higher levels of sexual activity. Despite the expense of medical and peer led involvement in teaching we consider that this programme has demonstrated the success of developing close working relationships between teaching and medical professions. Investment, by purchasers of health services, in health education for schoolchildren can only be justified if there is a demonstrable return in "health benefit."

Key messages

- There are effective and ineffective methodologies for teaching health and sex education
- Sex education using an effective methodology can be associated with postponement of first intercourse
- Doctors' participation in school sex education is welcomed
- Students appreciate a broad based sex education programme which includes learning negotiating skills

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Provision of sex education and early sexual experience: the relation examined

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Scp 414

Abstract

Objectives—To explore the relation between receipt of sex education and experience of first intercourse.

Subjects and design—The national survey of sexual attitudes and lifestyles is based on a sample of 18 876 respondents aged 16-59, randomly selected from the Post Office's small-user postcode address file. Data were collected between May 1990 and November 1991 by personal interviews combining a self administered questionnaire with a face to face interview.

Main outcome measures—Age at first intercourse, use of contraception at first intercourse, actual and preferred source of sex education (including school based lessons).

Results—Median age at first intercourse fell by four years for women and three years for men over the past four decades, to 17 for both men and women aged 16-19 at the time of interview. Of those respondents for whom school was the main source of information about sexual matters, men were less likely, and women no more likely, to have had intercourse before the age of 16 than were those citing other main sources, such as friends and the media. Both men and women were more likely to have used some method of contraception. In multivariate analysis, these effects remained after controlling for the effect of current age, educational attainment, and religious affiliation.

Conclusions—These data provide no evidence to support the concern that provision of school sex education might hasten the onset of sexual experience. These findings have important implications for the provision of sexual health education and highlight the need to carry out prospective and randomised studies of the impact of sex education.

Introduction

One of the most dramatic findings from the national survey of sexual attitudes and lifestyles was the sharp

fall in the age at which people become sexually active. The past few decades have seen a progressive reduction in the age at which sexual intercourse first takes place and an increase in the proportion of young people who had sexual intercourse before the age of sexual consent. Young people at the start of the 1990s were becoming sexually active some four years earlier than those making their sexual debut in the early 1950s.

The fall in the age at first intercourse is a major social trend and has clear policy relevance for the provision of sexual health services. Early experience of sexual intercourse is more likely to be accompanied by feelings of regret; it is associated with larger numbers of sexual partners, both in the recent past and over a lifetime; and—of greatest importance in terms of health consequences—it is less likely to be protected from unplanned pregnancy.^{1,2} The *Health of the Nation* white paper acknowledges the role of schools in helping to reach one of the targets set for sexual health—a reduction of at least 50% in the rate of conceptions in under 16 year olds by the year 2000.³ The suggestion is made by some that provision of school based sex education might encourage early sexual experimentation and promiscuity^{4,5}; others are at pains to point out that more sex education does not mean more sex and may contribute to a reduction in rates of sexually transmitted diseases and teenage pregnancy.⁷ The relation between experience of sex education and onset of sexual activity is pivotal to such discussions and is explored here by using data from the British national survey of sexual attitudes and lifestyles.^{1,2}

Method

The national survey of sexual attitudes and lifestyles is a random survey of 18 876 respondents aged 16-59 resident in Britain. The sampling frame was the Post Office's small-user postcode address file. Data were collected between May 1990 and November 1991 by means of personal interviews using a format combining self administered questionnaire with face to face

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