

A comparative study of peer-led and adult-led school sex education

A. R. Mellanby, R. G. Newcombe¹, J. Rees and J. H. Tripp

Abstract

There are, and have been, many school-based sex education projects in this country which have used peer leaders (students delivering an educational programme who are of similar, or slightly older, age than the students receiving the programme). Rigorous evaluation of the methodology remains scant. This paper describes a comparative investigation of peer-led and adult-led sex education in National Curriculum Year 9 (aged 13/14 years). The results from this study suggest that peer leaders appear to be more effective in establishing conservative norms and attitudes related to sexual behaviour than the adults. Peer leaders were less effective than adults in imparting factual information and getting students involved in classroom activities. These findings suggest that both adult-led and peer-led methods may have a place in effective sex education—the challenge being to determine which areas are best dealt with by whom.

Introduction

Education and improved contraceptive services were advocated as methods to achieve the Health of the Nation targets for sexual health (Secretary of State for Health, 1992). Although targets for sexual health were not subsequently identified in

Department of Child Health, University of Exeter, Exeter EX2 5SQ and ¹Department of Medical Computing and Statistics, University of Wales College of Medicine, Cardiff CF4 4XN, UK

Our Healthier Nation (Secretary of State for Health, 1999), promoting the sexual health of young people has been advocated more recently (Acheson, 1998), and similar recommendations have been reiterated in the UK through a variety of national and local initiatives. The importance of promoting sexual health, rather than simply avoiding sexual ill-health, particularly for young people, is being recognized. Government departments, both Health and Education, have acknowledged this, and initiatives include the development of a National Sexual Health Strategy and HIV Strategy (from Health), and from Education, the implementation of a Personal, Social and Health Education curriculum for children aged 5–16 years, and the more recent sex and relationship guidelines (Department for Education and Employment, 2000). The ‘joined-up thinking’ has also been reflected by the Teenage Pregnancy Report (Social Exclusion Unit, 1999), and the subsequent action plan and development of the National Healthy Schools Standard which aims to be in the majority of schools by April 2002. Despite these initiatives, what remains less clear are the specific methodologies required to achieve these aims of sexual health. Lack of effective method may at least partly account for recent evidence indicating that the sexual health of teenagers is not improving, that conceptions under 16 are again rising (Adler, 1997) and sexually transmitted infection (STI) rates are increasing among young people (Nicoll, 1999; Public Health Laboratory, 2000).

A review by Kirby *et al.* suggested several characteristics of school sex education that appear to be ‘essential’ if the aims include influencing student behaviour (Kirby *et al.*, 1994). Similar

'essential elements' were suggested following a review of smoking prevention education (Glynn, 1989). These suggestions included a narrow focus with specific intended behavioural outcomes, a minimum time of at least 14 h and a programme with activities based on a social influences theoretical model (Kirby *et al.*, 1994). Even within programs which display what appears to be a clear theoretical approach it is not clear how this translates into effective practice in the classroom nor who is most effective in delivering sex education sessions (White and Abraham, 2000). Effective sex education programmes have included examples of those delivered by teachers, older teenagers, health workers and others (Kirby *et al.*, 1994; Dickson *et al.*, 1997). Although many of the programmes considered effective have used older teenagers, Kirby *et al.* (Kirby *et al.*, 1994) did not consider peer leaders an essential component and evidence for peer-leader effectiveness is slender (Mellanby *et al.*, 2000). There is a growing body of literature surrounding youth-to-youth work, frequently defined as 'peer education' (Shiner, 1999). Other approaches such as 'peer helpers', 'peer counsellors' or 'peer mentors' are argued to be something different (Orme and Starkey, 1999). There are, and have been, many projects in this country which have used peer leaders (Health Education Authority, 1993), although the 'doctrine' of peer-led work may be questioned (Frankham, 1998), rigorous evaluation remains scant (Milburn, 1995) and few have an adequate theoretical basis (Turner and Shepherd, 1999).

This paper describes a comparative investigation of peer-led and adult-led sex education in National Curriculum Year 9 (aged 13/14 years). The aim was to determine whether there were aspects of the work where peer leaders were more effective in achieving specific outcomes. The peer-led component of sex education was delivered within an established programme (the A PAUSE programme—Adding Power And Understanding in Sex Education) which, in a controlled experiment, had demonstrated increases in knowledge, changes in beliefs and a relative decrease in first intercourse (Mellanby *et al.*, 1995).

Method

The intervention timetable

A PAUSE (Mellanby *et al.*, 1996a) is a programme of sex education for secondary schools. The whole programme has components across the secondary school curriculum and involves 10 specific sessions, six delivered by the A PAUSE team and four by groups of three or four teenagers aged 16/17 years. The six A PAUSE sessions require both a teacher, and a healthcare worker with an extensive knowledge of anatomy and physiology. The teenage-led sessions are, despite the age difference with their audience, referred to as peer leaders as has been the case in other research (Mellanby *et al.*, 2000). Additional sex and relationships education is delivered by the schools' own teachers who have received training and resources. The experiment described here is a comparison of the four Year 9 peer-led sessions: with one group of students receiving these sessions delivered by peers, the other by adults. Students in both groups received the remainder of the Year 9 and Year 10 programme. Normal school classes, with similar numbers of pupils, were used for all the sex education sessions in this study. The intervention was provided to all Year 9 students and carried out over two consecutive academic years.

The study population

Following the publication of results (Mellanby *et al.*, 1995), the North and East Devon Health Authority agreed to fund the staged implementation of the A PAUSE programme for all local secondary schools. This provided an opportunity to evaluate the peer-led programme by comparing the difference in effects with the same material delivered by adults in new intervention schools.

There were insufficient numbers of pupils to conduct a comparative evaluation using entirely new schools, and this required a pragmatic approach using both the old and new schools. Therefore, to compare the peer- and adult-led component of the intervention, the two schools used in the original experiment continued the whole programme including the peer sessions. Two

schools from among the six in the original control group were selected to provide a similar number and rural/urban match of students. The standard A PAUSE programme was introduced into these schools except that adults delivered the content of the peer sessions.

The intervention content

The A PAUSE programme is based on a collaborative social influences model (Mellanby *et al.*, 1996b) where Social Learning Theory (Bandura, 1976) is a central component. The social learning basis is dependent on altering all three major influences on behaviour: influencing personal factors, where knowledge and communication skills are improved; the social environment, by altering for example social norms of perceived prevalence of sexual intercourse; and actual behaviour, through demonstrated behaviour and role-play.

The four peer-led sessions are based on a programme devised by Marion Howard (Howard *et al.*, 1990) in North America. These were adapted, with permission, for use in this country. The sessions include presentations, small and large group discussions, and role-play. The role-plays involve using assertiveness skills to resist unwanted pressure. The assertiveness techniques are explained, demonstrated and then acted out with the younger students. The skills taught are extended from a simple 'how to say no' to negotiation and dealing with pressures without disrupting or terminating relationships.

In the original A PAUSE experimental study, the team who delivered the adult-led components in Year 9 and Year 10 consisted of a doctor and a senior teacher. As the programme was expanded to include further schools, new teachers and school nurses were recruited to deliver these adult-led sessions. This new adult team was trained to support and train teams of peer leaders for the standard programme, and to deliver the peer sessions themselves in this experiment. Students therefore received the sessions from either a group of three or four peer leaders, or two adults, a teacher and a nurse.

Peers and adults attended the same training

sessions. The same adults delivered the other six sex education sessions.

The theoretical and practical basis for the sessions was identical, and it was possible for the adults to deliver nearly all of the material in an identical manner to that of the peers. However, in the third 'peer session' role-plays involving dealing with sexual pressure take place between the peer leaders and the students. It was considered inappropriate for adult leaders to role-play sexual propositioning with students aged 13 and 14 since this could have been subject to considerable misrepresentation outside the classroom. To circumvent this, the role-play between adults and students was confined to rehearsing the assertiveness techniques with regard to other pressures. Pressure situations were derived from suggestions by students in the class (e.g. drugs, alcohol, staying out late, missing school, etc.). The assertiveness techniques were extended to relationships and sexual propositioning when dealt with in role-plays between class members during the fourth session.

Data collection

Data were collected from students using questionnaires administered at the start of the first session and approximately 1 week after the final session. The pre-intervention questionnaires were administered by the team delivering the sessions (either adults or peers). The post-intervention questionnaires were administered by the schools' teachers, usually during tutor time. In addition to the questionnaires, other data were collected from material used in the sessions.

In the second year in the urban adult-led school the data for that year has been lost. It is unclear how this happened; repeated searches of the school have been made without success.

Outcome measures

Questionnaires were used to evaluate measures of knowledge, attitudes, beliefs and involvement in the programme, and have been used previously (Phelps *et al.*, 1994). These questionnaires aim to evaluate the programme's ability to increase knowledge, change attitudes away from a percep-

tion that sexual intercourse on its own is beneficial to teenagers and to decrease the perception that sexually active teenagers (particularly young women) get a bad reputation, i.e. to increase tolerance. Four attitude questions were used to create a 'benefits of sexual intercourse' scale with a range of 0–4 (Cronbach's $\alpha = 0.89$) as previously used (Mellanby *et al.*, 1996a).

A main outcome of the previous A PAUSE experiment was a relative reduction in sexual intercourse in students who had received the intervention. Findings from the previous experiment (unpublished) and other surveys (Johnson *et al.*, 1994) suggested that few 13/14 year olds have had sexual intercourse. The schools involved, and the parents, would have been reluctant to subject Year 9 students to questionnaires asking for details of sexual behaviour. The concern is that asking students at this age whether they have had sexual intercourse might put 'ideas into their minds' by the implication that sexual intercourse was a normative behaviour and be associated with an increase in sexual activity (Halpern *et al.*, 1994). It was therefore considered unethical to include such questions to 13-year-old students. The main outcome for this study related to social expectations of normative behaviour: whether students considered that most teenagers would have had sexual intercourse by 16 years of age. This perception is part of the social influences model of health intervention where behaviour is seen to be directly related to factors the individual perceives as normal for their social group (Baric, 1977).

Teenagers frequently overestimate risk-taking behaviour amongst their age group (Grube *et al.*, 1986) and correcting overestimations of substance abuse amongst teenagers was found to be an effective method of preventing drug usage (Hansen and Graham, 1991). Previous information from the A PAUSE experiment (Phelps *et al.*, 1994; Tripp and Mellanby, 1995) suggested that the majority (around 70%) of young teenagers do believe that most teenagers have had sexual intercourse before 16 years. Most teenagers have not had sexual intercourse before they are 16 years of age (Curtis *et al.*, 1989; Johnson *et al.*, 1994; Tripp *et al.*,

1994). Although the age of first intercourse has been decreasing in recent years the median age of first intercourse is suggested to be 17.0 years (Johnson *et al.*, 1994).

Both pre- and post-intervention questionnaires were answered anonymously. To maintain anonymity and allow matching of questionnaires pre- and post-intervention, a self generated identity code (Kearney *et al.*, 1984; Grube *et al.*, 1989) was used, based on gender, month of birth, third letter of the student's first name and class group. All matches were checked for handwriting similarity in the free text responses.

Data analysis

Data were analysed by gender and intervention using the SPSS PC statistical package. Where questions were asked before and after the intervention, results are presented from students whose pre- and post-intervention questionnaires could be matched. After the matching procedure this left a residual of questionnaires which could not be matched, either because a student had attended only one questionnaire session or they had entered incorrect or insufficient details used for matching. There were no differences in outcome measure results in matched pre- and post-intervention questionnaire responses, and responses in questionnaires that could not be matched that were significant at the 5% level.

Where dichotomous data are used to compare results between interventions these are expressed as differences in proportions with 95% confidence limits and results of χ^2 tests in 2×2 contingency tables. For scores with normally distributed values means were compared and *t*-tests used to test the null hypothesis of no difference.

To evaluate pre-to-post changes between the two interventions the analysis took into account pre-intervention differences between the groups: for scores with normal distributions, a pooled within-schools regression coefficient was derived and used to adjust the post-intervention score; for dichotomous variables, a Mantel-Haenszel summary estimate of the differential intervention effect was derived to test for changes in the desired

Table I. Numbers of students taking part in the interventions

	Pre-test only	Post-test only	Matched pre- and post-test
Peer-led			
males	59	42	430
females	41	55	427
Adult-led			
males	33	38	237
females	28	40	223

Ten students in the peer-led group and 12 in the adult-led group did not give their gender.

direction (e.g. changes to 'correct' for factual questions). In both cases the adjusted differences are presented with 95% confidence limits and significance levels.

The unit of allocation in this study was the school. It is suggested that using the individual as the unit of analysis misleadingly increases the power of a study and increases the Type I error (Rooney and Murray, 1996). The results have therefore also been analysed to take intra-class correlation into account using the method described by Donner *et al.* (Donner *et al.*, 1981). This analysis inflates the variance to take account of agreement within clusters beyond the amount expected by chance. The procedure decreases the power of the study by effectively decreasing the number of units used in the comparison. For this analysis only those results significant at the 5% level when analysed by individual are presented with corrections for intra-class correlation.

Results

The number of students taking part in the intervention is shown in Table I. In the peer-led group there were 859 questionnaire pairs which could be matched pre- and post-intervention, and 205 combined pre- or post-test which could not be matched (total 1064). In the adult led group there were 461 matched questionnaires and 150 unmatched (total 611). The paired questionnaires have been used in the analysis of changes from pre- to post-intervention.

From the school rolls there were 1061 students in the peer-led school year groups and 624 in the adult-led school year groups. There were less than 1% of missing data items from the pre- and post-intervention questionnaires. Based on the school roll, the average attendance at the peer-led sessions was 79.9% and at the adult-led sessions 77.3%.

Test of knowledge and normative values

Table II gives the numbers and proportions of correct responses to four quasi-factual questions including one specific target question relating to perceived sexual activity amongst teenagers under the age of 16 years.

At pre-test, for the first three questions in Table II the adult-led group gave a higher percentage of correct answers, significant at the 5% level for the first question about conception and menstruation (difference in proportion [DP] 8.5%, 95% confidence interval [CI]: 3.4 to 13.5, $P = 0.001$). For the last question about the prevalence of sexual intercourse, at pre-test more of those in the peer-led group gave the correct response (DP 5.9% [95% CI: 1.1 to 10.7], $P = 0.02$).

In evaluating pre- to post-intervention changes between the two interventions only the (last) question relating to perceived prevalence of sexual intercourse was significant at the 5% level, with those who had received the peer-led intervention more likely to change to the correct answer. For this question the pre-intervention adjusted DP between the two interventions was 16.9% [95% CI: 11.6 to 22.3] $P < 0.001$. Similar results were found for males (adjusted DP 15.4% [7.84 to 22.9], $P < 0.001$) and females (19.3% [11.5 to 27.1], $P < 0.001$).

Knowledge of sexually transmitted diseases (STDs)

Students were asked to identify the names of pathogens associated with STDs from a list containing seven pathogens and five non-pathogens. Nearly all (97%) identified HIV at pre- and post-test. Overall across both interventions the mean scores increased from pre-intervention 1.7 to post-intervention 3.6 (mean difference 1.9 [1.8 to 2.0])

Table II. Responses to factual questions [no. (%) of correct answers]

	Matched data ^a	
	Pre-intervention	Post-intervention
A girl get pregnant if she has sex during her period? (Correct = True)		
male		
peer	185 (43.4)	286 (67.9)
adult	140 (59.6)	171 (72.2)
female		
peer	330 (77.6)	358 (85.4)
adult	176 (79.6)	195 (87.8)
When used correctly a condom is a 100% effective method of contraception (Correct = False)		
male		
peer	276 (64.6)	352 (82.6)
adult	164 (69.2)	204 (86.1)
female		
peer	330 (77.8)	379 (89.4)
adult	176 (79.3)	212 (95.1)
A girl can't get pregnant the first time she has sex (Correct = False)		
male		
peer	294 (68.5)	332 (77.6)
adult	169 (71.6)	180 (75.9)
female		
peer	331 (77.9)	372 (87.9)
adult	177 (80.1)	187 (83.9)
Most teenagers have had sex by the time they are 16 (Correct = False)		
male		
peer	133 (31.1)	268 (62.6)
adult	62 (26.2)	106 (45.3)
female		
peer	143 (33.7)	260 (61.3)
adult	59 (26.8)	88 (39.6)

^aData presented from students whose provided questionnaires which could be matched pre- and post-intervention and provided gender information (matched questionnaire numbers: males peer-led 430, male adult-led 237; females peer-led 427, females adult-led 223; with missing data <2% for questions in Table II).

paired *t*-test $P < 0.001$); increasing from 1.6 to 3.4 in the peer group and 1.9 to 4.1 in the adult group. The differential increase was greater for the adult-led intervention when corrected for pre-intervention score with an adjusted mean difference in scores between the interventions of 0.5 (0.4 to 0.7), $P < 0.001$. Similar differences were found

by gender—males: adjusted mean difference 0.5 (0.2 to 0.7, $P < 0.001$); females: 0.6 (0.4 to 0.8, $P < 0.001$).

Identification of assertiveness skill techniques

Students were asked to identify assertiveness techniques that could be used to prevent them being pressured into doing something they did not want to do. Their responses were given in free text. Five categories of assertiveness techniques were used to assess and code the students' responses:

- (1) Saying no.
- (2) Repeating 'no'.
- (3) Looking the person in the eyes/looking as though you meant it.
- (4) Taking the offensive and reversing the pressure.
- (5) Refusing to talk about the situation after saying no or walking away.

The responses were added to give an assertiveness score with range 0–5. The overall mean score across both interventions increased from 1.6 to 2.2 (mean difference 0.7 [0.6 to 0.7], paired *t*-test $P < 0.001$). At pre-test the peer-led group had a higher assertiveness score than the adult-led group (peer mean score 1.6; adult 1.5; mean difference 0.1 [0.1 to 0.2], $P < 0.001$).

When adjusted for pre-intervention, the post-intervention mean scores were similar (adjusted mean difference 0.1 [–0.1 to 0.2], $P = 0.32$), although for females the score was higher after the adult-led session (adjusted mean difference for females peer versus adult 0.2 [0.03 to 0.3], $P = 0.02$).

Attitude questions

Students were asked to respond to a bank of seven questions. The first four related to the effect of sexual activity on teenage relationships. The questions have been grouped using positive responses giving a score ranging from 0 to 4. A higher score indicates more responses suggesting that sexual intercourse is beneficial to teenagers and their relationships. Overall the mean scores

decreased from 1.7 positive answers to 1.4 (mean difference 0.2 [0.2 to 0.3], $P < 0.001$); decreasing from 1.7 to 1.4 in the peer group and 1.6 to 1.5 in the adult-led group.

The adult-led group were more likely to continue to give responses indicating the beneficial effects of sexual intercourse (adjusted mean score difference 0.2 [0.01 to 0.3], $P = 0.035$). Similar direction of differences were found by gender, although not significant at the 5% level (males: adjusted mean difference 0.2 [0.03 to 0.4], $P = 0.09$); females: 0.1 [-0.6 to 0.3], $P = 0.18$).

Three further attitude questions were included—two asking whether young teenage boys or girls get ‘a bad reputation’ if they have sex and one asking whether unmarried people should not have sex. At pre-test the adult-led group were more likely to answer that girls get a bad reputation if they have sex (adult-led 51.2%, peer-led 44.9%; DP 6.3% [0.9% to 11.8%], $P = 0.02$).

At post-test the adult-led group were more likely to agree that girls get a bad reputation if they have sex (adjusted DP 8.2% [2.9 to 13.6], $P = 0.003$) and less likely to answer that boys get a bad reputation if they have sex (DP 6.2% [2.1 to 10.4], $P = 0.004$). The change in responses to whether unmarried people should not have sex was less than 2%, although this was not an issue addressed in the programme.

Involvement in session activities

Students answered four questions after the intervention about their involvement in various activities in the sessions. Four possible responses ranged from ‘a lot’ to ‘none’. Of students who received the adult-led programme, 30% answered that they joined in ‘a lot’ for three or more of the activities compared to 20% who received the peer-led programme (overall mean score difference 0.3 [0.1 to 0.5], $P = 0.016$).

Session assessment

Students were asked if they felt they had learnt anything from the sessions and whether they had felt embarrassed, with four responses from ‘not at all’, ‘a bit’, ‘very little’ or ‘a lot’.

Overall, 54.3% answered that they had learnt ‘a bit’ and 35.5% ‘a lot’, with more females (95.9%) in the peer-led group giving these two answers compared to (81.6%) in the adult-led group (DP 14.3% [9.1 to 19.4], $P < 0.001$). The results for males were similar for the peer-led (89.4%) and adult-led (90.4%) groups.

A greater proportion of both male and female students in the peer-led sessions answered that they felt embarrassed compared to the adult-led sessions (male students: peer-led 47.7%, adult-led 24.2%; DP 23.5% [16.5 to 30.0], $P < 0.001$; female students: peer-led 51.9%, adult-led 24.3%; DP 27.5% [20.4 to 34.1] $P < 0.001$).

Talking to other people about the sessions

Students were asked if they had talked to anyone about the sessions (there were four possible categories plus ‘other’ given in the questionnaire). The responses were added to provide a score with range 0 to 5. Female students were more likely than males to answer that they had talked to someone (mean scores: females 1.7; males 1.2; mean difference 0.4 [0.3 to 0.5], $P < 0.001$). The results for the peer-led and adult-led interventions were similar (mean scores: peer-led score 1.5; adult-led 1.4; mean difference 0.1 [-0.02 to 0.2], $P = 0.12$).

Results from activities during the sessions

Reasons ‘why’ (Session 1)

During a small-group exercise, students wrote down all the reasons why they thought teenagers of their age might have sex and reasons why they might wait. These responses were collected during the first year of the comparison. The groups were mostly self-selected three to five students and often single gender. Their answers were written on A1 sheets and their free text grouped for analysis. The responses from the two interventions were similar, with 49.4% of peer-led and 46.6% of adult-led responses for starting sex related to reasons not directly related to the relationship (pressure, image and drugs or alcohol), and 31.0% peer-led and 26.8% adult-led reasons for waiting being due to pregnancy and STDs.

Table III. Student's responses during a session exercise on setting limits in physical relationships

Where do you think someone of your age should stop...	Peer-led group	Adult-led group
Minimal (smiles, holding hands, hugs and kisses)	294 (32.0)	96 (18.7)
Exploring/touching above the waist	296 (32.2)	160 (31.1)
Exploring/touching below the waist	268 (29.2)	189 (36.8)
Having sexual intercourse	60 (6.5)	69 (13.4)

A total of 924 responses obtained from the peer-led group including six 'other' responses, 519 from the adult-led group with five 'other' responses.

The exact number of students present at this session is not known since the teams did not take registers. Using the school roll numbers for the first year (adult-led 441, peer-led 537) and an estimated average group size of four (adult-led 110 groups, peer-led 134) more responses were obtained in the adult-led groups than the peer-led groups (reasons for starting sex: adult-led 7.3 responses per group, peer-led 4.7, OR 1.5 [1.2 to 2.0] $P = 0.002$; reasons for waiting: adult-led 7.2 responses per group, peer-led 4.4, OR 1.6 [1.2 to 2.1] $P < 0.001$).

Setting physical limits (Session II)

Students were asked to write down where they thought someone of their age should stop at in expressing physical affection in relationships. The results from these answers are shown in Table III. A greater proportion of students in the adult-led group indicated that 'having sex' was appropriate at their age than those in the peer-led group (adult-led 13.4%, peer-led 6.5%; DP 6.9% [3.5 to 10.2] $P < 0.001$).

Correction for intra-class correlation

Table IV gives the results analysed by individual and corrected for intra-class correlation. Only overall results significant at the 5% level when analysed by individual have been included.

Discussion

In relation to the overall aims of the programme, students did increase their knowledge of sexual

health issues, they did tend to change their views towards more conservative 'norms' and they did change their attitudes away from perceiving that sexual intercourse on its own is beneficial to themselves or their relationships. These findings are similar to those previously reported from the A PAUSE programme (Mellanby *et al.*, 1995, 1996a). It has been reported that peer education has positive outcomes for the peer-educators [e.g. (Phelps *et al.*, 1994)]. In this study we did not investigate outcomes for the 16/17 year olds of having been a peer leader or, indeed, the advantages perceived by the adults of having been adult leaders.

The results from this study presented using the individual as the unit of analysis are in line with previously presented research into peer-led education (Mellanby *et al.*, 2000). This may misleadingly overestimate the power of a study to detect differences where the school, not the individual, is the unit of allocation to intervention. Using a measure of the intra-class correlation makes the estimates of effect more conservative and thereby takes account of the possibility of this effect. Using this conservative estimate, many of the outcome variables show no significant difference at the 5% level. Despite this, the results suggest differences between the peer-led and adult-led groups in respect of the main outcome variable (accurate identification that most teenagers have not had sex before 16 years of age).

Comparison of peer-led and adult-led effects

The main outcome objective of the intervention in Year 9 was to establish or confirm 'conservative norms' a process found effective in other health education interventions (Hansen and Graham, 1991). The 'norm' in this case being that most teenagers have not had sexual intercourse before 16 years. The peer educators appear to have been considerably more effective in establishing this norm than the adults. This finding would confirm the theoretical basis and previous research findings of peer influences in health education (Utech and Hoving, 1969; Lindsey, 1997).

Table IV. Comparison of results between peer- and adult-led intervention types—analysed by individual and corrected for intra-class correlation^a

Peer-led group compared to the adult-led group	Analysis by individual		Corrected for intra-class correlation	
	Mean differences (95% CI)	P	Mean differences (95% CI)	P
Smaller increase in identified STD pathogens between pre- and post-test (STD score lower)	-0.5 (-0.74 to -0.47)	<0.001	-0.5 (-1.6 to 0.5)	0.14
Students were more likely to change their opinion away from perceived beneficial effects of sex ('benefits of sex' attitude scale lower score)	0.2 (0.01 to 0.3)	0.035	0.2 (-0.1 to 0.4)	0.10
	DP (95% CI)	P	DP (95% CI)	P
Students gave fewer responses in Session 1 group exercise	-8.8 (-11.2 to -6.4)	<0.001	-8.8 (-15.6 to -2.0)	0.010
Fewer students answered that 'sexual intercourse' and was appropriate at their age	-6.9 (-10.2 to -3.5)	<0.001	-6.9 (-13.2 to -0.5)	<0.021
Students were more embarrassed	25.4 (20.6 to 30.2)	<0.001	25.4 (16.4 to 34.5)	<0.001
Fewer students answered that sexually active girls get a bad reputation	-8.2 (-13.6 to -2.9)	0.003	-8.2 (-19.5 to 3.0)	0.081
More students answered that sexually active boys get a bad reputation	6.2 (2.1 to 10.4)	0.004	6.24 (0.3 to 12.2)	0.021
More students correctly identified that most teenagers have not had sex before 16 years	17.0 (11.6 to 22.3)	<0.001	17.0 (5.3 to 28.6)	0.004

^aData derived from all the questionnaires matched pre- and post-intervention (peer-led N = 859; adult-led N = 461).

The results also suggest that when asked what levels of sexual activity are appropriate for 13/14 year olds, teenagers are more likely to answer that they consider sexual intercourse an appropriate level of activity when taught in the adult-led compared to the peer-led sessions. This study has not provided information on why this might have been. Whatever the cause, these results taken with the attitude changes towards the benefits of sexual intercourse and the increase in 'stereotypical' attitudes towards girls reputations suggest that the results from adult-led sessions are less effective in achieving the aims of the sessions than those delivered by peers. The findings also emphasize the need to have clear objectives, to monitor the process and to measure outcomes in sex education if unwanted results are to be avoided.

Students in the intervention were more likely to answer that they were embarrassed during the peer-led sessions than the adult-led sessions. A similar level of embarrassment, expressed by around half of the students, has been found previously with this peer intervention (Phelps *et al.*, 1994). Students were not asked whether they did or did not like the sessions in this part of the evaluation. It is possible that embarrassment in the peer-led programme was related to the greater degree of 'propositioning' in their sessions and further evaluation is needed to determine whether this is an essential part of the programme. However, students' excitement, noise and laughter, and the comments of observing teachers (unreported) during the sessions suggested that the students were enjoying the programme. Previous evaluation in Year 11 of students who had completed the A PAUSE programme, including the peer sessions, showed that 76% of students approved of their sex education compared to 42% of controls (Mellanby *et al.*, 1995).

The peer-led schools had been receiving A PAUSE sex education delivered by the research team for 3 years prior to this experiment, whereas the adult-led schools came new to the project. The differences in pre-test findings may reflect the differences in approach to sex education in the years prior to the intervention in Year 9 and

information disseminated from older students. At pre-test students in the adult-led group were more knowledgeable about STDs and reproductive physiology. This may relate to their schools having a greater factual content to their sex education compared to those receiving the A PAUSE programme. At pre-test students in the peer-led group knew more assertiveness techniques and were less likely to answer that most teenagers have had sex before 16 years, despite not having dealt with these issues in school sex education. It is possible that some of the difference in the pre-test findings in the peer-led group relate to dissemination of the A PAUSE session content from older to younger students (e.g. in families), which is an aim of the overall programme. These findings do suggest that there were differences between the schools, before the intervention started, which was taken into account in the analysis. Most importantly, the post-test difference in the main outcome measure related to predicted prevalence of teenage sexual intercourse shows a greater proportion of peer-led students changing to correct answers despite the higher pre-test starting point.

Although the adult-led and peer-led intervention was not a randomized controlled trial which may not meet the 'gold standard' of evidence, the relevance of randomized control trials in evaluating health promotion experiments has been questioned (Green and Tones, 1999). There are other methodological considerations which limit the strength of the findings. In part, this relates to the lost data set which has reduced the power of the experiment to detect a differences between the two interventions. Additionally, in this study we did not examine differences in the quality of the interventions nor the programme fidelity. It is possible that some of the detected differences may have been due to style and adhering to the programme rather than related to a generic peer-led or adult-led programme. The finding that the peer-led results are similar to our previous evaluation (Phelps *et al.*, 1994) does suggest that the results presented here are not reliant on the particular group of peers used. Further qualitative investigation into the adult-led programme would provide useful

information. However, despite the analytical and methodological problems, this study does suggest differential effects between the two styles of delivery. This study has not investigated why peers might be more effective in changing attitudes. Peers may be more influential as role models or may be more popular; further investigation into the perceptions of students receiving such a programme would provide greater insight into these factors.

These results suggest that different technologies may be used to different effect. Peer-led education may be no more effective in transmitting factual health information but more successful in dealing with teenage relationships and setting conservative norms.

Young people as peer leaders cannot be expected to deliver all aspects of sex education. They are likely to be full-time students themselves, and it would be inefficient (and inappropriate) to train teenagers to become experts in all topics covered by sex education and to cover all students in primary, secondary and further education. The challenge is to determine how peer-led sex education can be integrated into mainstream education and to determine which areas are best dealt with by whom. Sex education is not a simple issue and public reaction is quick to criticize processes which are deemed to overstep the mark (Jones, 1994). Therefore, it is important to have clear ideas of the theoretical basis, content and evaluation methodology of peer-led sex education to determine its effectiveness, quality and acceptability. There is still a need for longer-term follow-up to determine whether the differences found in this study translate into differences in outcomes such as a reduction in unwanted pregnancies and STIs.

The aims of sex education are ambitious, relating to the lifelong quality of relationships and personal well-being as well as health-related behaviour; it should be age appropriate and available to everyone through a variety of formal and informal settings (BMA Foundation for AIDS, 1997). Sex and relationships education should not be a negative process that attempts to frighten teenagers away from a powerful biological drive. Adults telling

teenagers not to have sex does not appear to stop them (Christopher and Roosa, 1991). Peer-led sex education may be a more effective method of assisting teenagers to develop skills and set their own standards of behaviour than instruction from adults. It may be that empowered teenagers are more conservative about sex and relationships than teenagers exposed to the pressures of a purely adult world. Whatever the effective components of sex education are, the positive aspects of sexual and intimate relationships should not be forgotten. 'Everybody' may not be doing it now but they will nearly all, not only wish to at some time, but will hope for long and positive sexual relationships in their adult lives. The prime aim of any sex education should be to make such an outcome more likely for a greater number of individuals.

References

- Acheson, D. (1998) *Independent Inquiry into Inequalities in Health*. The Stationery Office, London.
- Adler, M. W. (1997) Sexual health—a Health of the Nation failure. *British Medical Journal*, **314**, 1743–1747.
- Bandura, A. (1996) *social Learning Theory*. Prentice Hall, Englewood Cliffs, NJ.
- Baric, L. (1977) Social expectations vs. personal preferences—two ways of influencing health behaviour. *Journal of the Institute of Health Education*, **15**(3), 23–28.
- BMA Foundation for AIDS. (1997) *Using Research on Effectiveness to Guide the Development of School Sex Education*. BMA Foundation for AIDS, London.
- Christopher, F. S. and Roosa, M. W. (1991) An evaluation of an adolescent pregnancy prevention program: is 'just say no' enough? *Family Relations*, **39**, 68–72.
- Curtis, H. A. Lawrence, C. and Tripp, J. H. (1989) Teenage sexuality: implications for controlling AIDS. *Archives of Disease in Childhood*, **64**, 1240–1245.
- Department for Education and Employment (2000) *Sex and Relationship Guidance*. DFEE 2000 0116/2000. DFEE, London
- Dickson, R., Fullerton, D., Eastwood, A., Sheldon, T. and Sharp, F. (1997) Preventing and reducing the adverse effects of unintended teenage pregnancies. *Effective Health Care, York*, **3**, 1–12.
- Donner, A., Birkett, N. and Buck, C. (1981) Randomization by cluster: sample size requirements and analysis. *American Journal of Epidemiology*, **114**, 906–914.
- Frankham, J. (1998) Peer education: the unauthorised version. *British Educational Research Journal*, **24**, 179–192.
- Glynn, T. J. (1989) Essential elements of school based smoking prevention programs. *Journal of School Health*, **59**, 181–188.
- Green, J. and Tones, K. (1999) Towards a secure evidence base for health promotion. *Journal of Public Health Medicine*, **21**, 133–139.

- Grube, J. W., Morgan, M. and Kearney, K. A. (1989) Using self generated identification codes to match questionnaires in panel studies of adolescent substance abuse. *Addictive Behaviors*, **14**, 159–171.
- Halpern, C. T., Udry, J. R. and Suchindran, C. (1994) Effects of repeated questionnaire administration in longitudinal studies of adolescent males' sexual behavior. *Archives of Sexual Behavior*, **23**, 41–57.
- Hansen, W. B. and Graham, J. W. (1991) Preventing alcohol, marijuana, and cigarette use among adolescents: peer pressure resistance training versus establishing conservative norms. *Preventative Medicine*, **20**, 414–430.
- Health Education Authority (1993) *Peers in Partnership*. Health Education Authority, London.
- Howard, M., Blamey, J. A. and McCabe, J. (1990) Helping teenagers postpone sexual involvement. *Family Planning Perspectives*, **22**, 21–26.
- Johnson, A. M., Wadsworth, J., Wellings, K. and Field, J. (1994) *Sexual Attitudes and Lifestyles*. Blackwell Scientific Publications, Oxford.
- Jones, J. (1994) Nurse in sex education row speaks out: 'I'm a political pawn'. *The Observer*, Sunday March 27, 24.
- Kearney, K. A., Hopkins, R. H., Mauss, A. L. and Weisheit, R. A. (1984) Self-generated identification codes for anonymous collection of longitudinal questionnaire data. *Public Opinion Quarterly*, **48**, 370–378.
- Kirby, D., Short, L., Collins, J., Rugg, D., Kolbe, L., Howard, M., Miller, B., Sonenstein, F. and Zabin, L. S. (1994) School-based programs to reduce sexual risk behaviors: a review of effectiveness. *Public Health Reports*, **109**, 339–359.
- Lindsey, B. J. (1996) Peer education: a view point and critique. *Journal of the American College of Health*, **45**, 187–189.
- Mellanby, A. R., Phelps, F. A., Crichton, N. J. and Tripp, J. H. (1995) School sex education: an experimental programme with educational and medical benefit. *British Medical Journal*, **311**, 414–417.
- Mellanby, A., Phelps, F. and Tripp, J. (1996a) *A PAUSE: Adding Power And Understanding in Sex Education. The Project and Results*. Research and Development Directorate, South and West NHS Executive.
- Mellanby, A., Rees, J. and Tripp, J. (1996b) The power to be ME: the A PAUSE sex education project. In Seddon, D. (ed.), *Sexual Awakening*. Medical Research Council, London, pp. 31–39.
- Mellanby, A. R., Rees, J. B. and Tripp, J. H. (2000) Peer-led and adult-led school health education: a critical review of available comparative research. *Health Education Research*, **15**, 533–545.
- Milburn, K. (1995) A critical review of peer education with young people with special reference to sexual health. *Health Education Research*, **10**, 407–420.
- Nicoll, A., Catchpole, M., Cliffe, S., Hughes, G., Simms, I. and Thomas, D. (1999) Sexual health of teenagers in England and Wales: analysis of National data. *British Medical Journal*, **318**, 1321–1322.
- Orme, J. and Starkey, F. (1999) Peer drug education: the way forward? *Health Education*, **1**, 8–16.
- Phelps, F. A., Mellanby, A. R., Crichton, N. J. and Tripp, J. H. (1994) Sex education: the effect of a peer programme on pupils (aged 13–14 years) and their peer leaders. *Health Education Journal*, **53**, 127–139.
- Public Health Laboratory Service Website. *Data on STIs in England*. <http://www.phls.co.uk/facts/STI/DataOnSTIsInEngland.htm>. Consulted 20 April 2000.
- Rooney, B. L. and Murray, D. M. (1996) A meta-analysis of smoking prevention programs after adjustment for errors in the unit of analysis. *Health Education Quarterly*, **23**, 48–64.
- Secretary of State for Health (1992) *The Health of the Nation: A Strategy for health in England*. The Stationery Office, London.
- Secretary of State for Health (1999) *Saving Lives: Our Healthier Nation*. The Stationery Office, London.
- Shiner, M. (1999) Defining peer education. *Journal of Adolescence*, **22**, 555–566.
- Social Exclusion Unit (1999) *Teenage Pregnancy: A Report by the Social Exclusion Unit*. The Stationery Office, London.
- Tripp, J. and Mellanby, A. (1995) Sex education—whose baby? *Current Paediatrics*, **5**, 272–276.
- Tripp, J., Mellanby, A. R., Phelps, F., Curtis, H. A. and Crichton, N. J. (1994) A method of determining rates of sexual activity in schoolchildren. *AIDS Care*, **6**, 453–457.
- Turner, G. and Sheperd, J. (1999) A method in search of a theory: peer education and health promotion. *Health Education Research*, **14**, 235–247.
- Utech, D. A. and Hoving, K. L. (1969) Parents and peers as competing influences in the decisions of children of differing ages. *Journal of Social Psychology*, **78**, 267–274.
- White, D. and Abraham, C. (2000) From psycho-social theory to sustainable classroom practice: developing a researched-based teacher-delivered sex education programme. *Health Education Research*, **15**, 25–38.

Received on May 31, 2000; accepted on January 14, 2001