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The effectiveness of school-based sex education: What do rigorous evaluations in Britain tell us?

Until the start of this century there was little robust research evidence on the effectiveness of school-based sex education. Many in health promotion argued that well designed, timely sex education could substantially reduce sexual risk taking, but others argued that if delivered too early it promotes greater sexual activity. A third, more sociological, perspective was that sex education cannot override the many other personal and social influences on sexual behaviour. In the last decade four large scale evaluations of three school-based sex education programmes in Britain have been published in academic journals. Considered together they should largely resolve these conflicting claims. This article briefly describes each of these programmes and how they were evaluated. It then summarises the main evaluation findings, in terms of implementation and outcomes, and discusses their implications for future sexual health promotion.

The progammes and their evaluation

SHARE

SHARE, a 20 session programme for 13 to 15 year olds, is an example of teacher-delivered sex education, the most widely practiced approach to formal sex education. However, unlike most school sex education it is theory-based (Wight et al., 1998) and delivered by teachers specially trained for five days. The main topics covered are: physiology, relationships, typical experiences of early sex, contraception, parenthood, sexually transmitted infections (STIs), and skills for sexual negotiation, condom use and accessing local sexual health services. It combines active learning and skills development, primarily through the use of interactive video but also role-playing (Wight and Dixon, 2004). SHARE has all ten characteristics Kirby identified as necessary for effective programmes (Kirby, 1999).

SHARE was evaluated through a cluster randomized controlled trial with 25 schools from 1996-2004, following up young people from the age of 13 or 14 to the age of 20 (Wight et al., 2002). All pupils in third year secondary (aged 13-14 years) were eligible, with 5,854 participating at initial follow-up, at age 15/16. Outcome data were collected through self-complete questionnaires in exam conditions. The main outcome was unsafe sex and secondary outcomes included contraceptive use, regret of sexual encounters, coercive sex and practical sexual health knowledge. At age 20, the impact of the intervention on pregnancies and terminations was established using routinely collected NHS data, which were not subject to reporting bias and only to minimal attrition (Henderson et al., 2007).

This outcome evaluation was complemented by an extensive evaluation of processes, addressing: the quality of programme delivery; the experiences of

those delivering it; the influence of context; and whether response to the intervention differed by schools or pupils (Wight and Obasi, 2003). Data were collected primarily through teacher and peer-educator questionnaires and interviews, pupil interviews, group discussions and classroom observation.

It is important to consider what an intervention is compared against. In the SHARE control schools there was a total of 7 to 12 sex education lessons in secondary 3rd and 4th years, primarily devoted to information provision and discussion. Only two of the twelve schools had condom-handling demonstrations and none systematically developed negotiation skills for sexual encounters. Teacher training opportunities for sex education were generally very limited.

RIPPLE

RIPPLE was a peer-delivered sex education programme which, when designed, was widely believed to be a more appropriate approach than teacher-delivered programmes (Milburn, 1995). Year 12 pupils (aged 16-17 years) were recruited as peer-educators and trained to use participatory methods with Year 9 pupils in three classroom sessions: on relationships, STIs, and condoms and contraceptives. The sessions were not based on a specific theory but were meant to develop skills in sexual communication and condom use, and knowledge about pregnancy, STIs, contraception and local sexual health services. They each lasted around one hour, teachers were not present, and they replaced the usual teacher-led sex and relationships education (SRE) in intervention schools.

The evaluation of RIPPLE, from 1997-2005, largely followed that of SHARE, using a cluster randomised controlled trial with 27 schools (Stephenson et al., 2004). All pupils in Year 9 (aged 13-14 years) were eligible with 6,656 participating in the follow-up at age 15/16. Similar outcome data to SHARE were collected through self-complete questionnaires. At age 20, NHS data were sought on pregnancies and terminations for the young women in the trial. As with SHARE, the outcome evaluation was complemented with an extensive process evaluation using similar methods (Oakley et al., 2006).

In the RIPPLE control schools, the number of SRE sessions from Years 9 to 12 varied from 0 to 12, with a mean of 6-7. Most teachers reported covering contraception, STIs and relationships at least once, though pupils were less likely than teachers to report that relationships had been addressed. Information provision predominated and there was little development of skills (Strange et al., 2006).

HEALTHY RESPECT

Finally, the Scottish Government's Demonstration Project Healthy Respect was a multi-component intervention whose main elements were SHARE, extended to cover 2nd, 3rd and 4th years of secondary school, youth friendly drop-in sexual health services, media campaigns and branding. It encouraged partnerships between the National Health Service, Local Authorities and the voluntary sector. The programme aimed to improve sexual health, including respect for other sexual orientations, and to reduce sexual health inequalities.

The Scottish Government's prior decisions on where to deliver Healthy Respect meant that trials could not be randomised, and so it was evaluated through two quasi-experiments. Both involved before-and-after cross sectional surveys. In the first, from 2001-03, pupils of average age 14 years, 6 months in 10 Healthy Respect schools in Lothian (N=2,798) were compared with pupils in five Grampian schools (N=1,583) (Tucker et al., 2006). In the second, from 2007-09, intervention and comparison areas were matched for teenage pregnancy and

terminations, and schools matched by social deprivation (Elliot et al., 2010). Pupils aged 15-16 years in six Lothian Healthy Respect schools (N=2,269) were compared with pupils in six west of Scotland schools (N=3,014). In the comparison areas school sex education consisted mainly of information giving and discussion. Sexual health services were less available and not linked to schools. There was no overarching communications strategy.

Successes and challenges in delivery

Nearly all SHARE teachers preferred the SHARE pack to previous SRE and they welcomed the SHARE teacher training. However, the introduction of social-psychologically informed skills-based exercises was the least successful aspect of the training (Wight and Buston, 2003). Faithful delivery of SHARE was also hindered by time constraints and low priority accorded to PSE by senior management, leading to non-trained teachers delivering the programme in some schools (Buston et al., 2002). Many pupils were embarrassed in sex education lessons, a problem exacerbated by mixed sex classes, but teachers could play an important role in minimizing this (Buston and Wight, 2004).

RIPPLE peer-educators seemed to be a self-selecting group with clear social differences from their target group, being high academic achievers and socially advantaged (Strange et al, 2002). The peer-led sessions seemed most effective when they were participative and skills based. The peer-educators were less good than teachers at engaging those pupils at greatest sexual risk (Oakley et al., 2006). Teachers were enthusiastic about the philosophy of peer-led sex education, but the logistics of organising the training programme and subsequent peer-led sessions was very time consuming.

Both the SHARE and RIPPLE programmes were considered more satisfactory by pupils undergoing them than was the conventional sex education in control schools. However, with both interventions many pupils expressed a wish to have at least some single-sex sessions (Strange et al., 2003; Buston and Wight, 2004), and there was some evidence that the relatively lax discipline in peer-education was attractive to boys but at the cost of girls' sense of comfort and safety (Strange et al., 2003).

In the Healthy Respect programme pupils engaged well with the teacher-delivered component, SHARE. They could articulate the key messages and identified how it had affected their knowledge, confidence and communication, but not their behaviour. They had least recollection of sessions on negotiation skills. The drop-in sexual health services were well implemented and well received by young people, with high client satisfaction reported in surveys. Almost two-thirds (60%) felt confident about attending the clinics, but approximately 15% felt slightly or very anxious. Awareness of the Healthy Respect logo and literature was around 40%, but awareness of what Healthy Respect stood for was about half this.

SHARE was designed to be readily sustainable within the existing Scottish education system and proved to be so, having been widely taken up by secondary schools across Scotland. The main cost is approximately £900 per teacher for the five day training course and staff cover. Once trained, teachers can deliver the course indefinitely. Following its second evaluation Healthy Respect was integrated into NHS Lothian and continues to provide information to young people and to operate the sexual health drop-in services. SHARE teacher training is now delivered by both the local and national health promotion agencies (Elliot et al., 2010). Peer education, on the other hand, is less readily sustained since peers can only play their role for a

limited period. Following the RIPPLE trial the intervention schools did not have further funding for the external peer educator training team (health promotion experts). A few enthusiastic schools continued the programme through separate arrangements with local trainers.

Outcomes

The SHARE trial showed that, in comparison with conventional sex education, SHARE was evaluated more highly by both pupils and teachers, it increased practical sexual health knowledge and it slightly improved the quality of sexual relationships, primarily through reduced regret. However, the programme only had an extremely small (positive) effect on four of the many cognitions targeted (Abraham et al., 2004), and by the mean age of 16 years, 1 month, there was no impact on age of first intercourse, levels of sexual activity, condom or contraceptive use (Wight et al., 2002). The lack of behavioural impact was confirmed at final follow-up. Using NHS data for all young women in the trial, by the age of 20 there was no significant effect of SHARE on either pregnancies or terminations (Henderson et al., 2007).

Interim findings from RIPPLE, at mean age 16 years, 0 months, showed that peer-led SRE was more popular than teacher-led SRE. It was associated with improved knowledge about preventing STIs and, for girls, greater confidence about using condoms and a reduction in the proportion reporting sexual intercourse by follow-up (38% v. 43%) (Stephenson et al., 2004). However, girls in the peer-led arm reported lower confidence about refusing unwanted sexual activity (borderline significance). There was no significant difference between arms of the trial in: knowledge about emergency contraception, common STIs, and accessing sexual health services; confidence about discussing sex; regretted first sex (or other measures of quality); reported sex by age 16 for boys, or condom use (for both sexes). By the age of 20 there was no significant effect of RIPPLE on either pregnancies or terminations (Stephenson et al., 2008).

The first evaluation of Healthy Respect found that it improved knowledge about condoms and confidence in getting and using them properly (Tucker et al., 2006). However, there were no other improvements in knowledge, attitudes, intentions or behaviours. The second evaluation of Healthy Respect showed improved sexual health knowledge and males' use of condoms on "most occasions" slightly increased, while in the control arm it reduced over time (Elliot et al., 2010). Females became less accepting of condoms but there was no change in reported condom use. Pupils became more tolerant of sexual coercion and attitudes towards same-sex relationships remained largely unaffected. More young people in the Healthy Respect area used sexual health services, including those from lower socio-economic backgrounds. This aside, sexual health inequalities by housing status remained.

Discussion

All three programmes evaluated clearly improved sexual health knowledge, and they had some positive impacts on attitudes. SHARE teachers seemed to improve knowledge more than RIPPLE peer educators, but SHARE had only an extremely small (positive) effect on attitudes, while the effects of RIPPLE were larger (Stephenson et al., 2004). This confirms findings from the evaluation of A PAUSE, an English sex education programme which combined teacher- and peer-delivered sex education, that peers are better at modifying norms than teachers, but that teachers are better at improving knowledge (Mellanby et al., 2001).

However, the programmes had minimal effect on reported behaviour. SHARE had

no impact and although RIPPLE slightly reduced girls' reported sex by age 16, there was no effect on other behavioural outcomes, including contraception. Healthy Respect increased reported overall condom use but not condom use at first intercourse or any other behavioural measures. The studies with more objective sexual health outcomes, SHARE and RIPPLE, found no impact on conceptions or terminations by age 20.

There are several possible explanations for these disappointing results. First, it is important to note that the programmes were being compared against existing school sex education, and, furthermore, the comparison schools probably had more thorough sex education than those that declined to participate. In the control arms, reported condom use at first sex was 69% in SHARE and 78% in RIPPLE. These levels of precautionary behaviour suggest that health promotion messages from a combination of different sources (including conventional school sex education) are already achieving behavioural change. This makes the further reduction of unsafe sex by a new programme much more challenging.

Second, the impact of even a 20-period school sex education programme, let alone three hours of peer education, might be insignificant compared with long term and pervasive influences, such as expectations about sexual relationships shaped by one's family (Vanwesenbeeck et al., 1999; Dilorio et al., 2003), friends, local culture (Thomson, 2000) and the mass media (Brown et al., 2006). More specifically, skills-based exercises in 40-80 minute lessons might be too short to develop sexual interaction skills.

Third, skills-based lessons probably require high motivation to be successful, implying that participants should opt into an intervention, rather than being a captive audience. Psychological models of the antecedents of action emphasise motivation (Michie et al. 2005) and successful psychologically-based programmes often involve the participants' self-motivation (Kalichman et al., 1996). In Scottish secondary schools, on the other hand, PSE is one of the subjects perceived by pupils to require the least attention or effort, since it is not examined.

Drawing on the last two explanations, it may be that sexual health interventions have to coincide with critical points in a young person's own sexual experiences to be effective. Since routine classroom-based sex education generally has to be delivered at a given time for the whole year group, it is unlikely to coincide with pupils' first sexual experiences for more than a small minority. It is therefore likely to come too late or too early, and in the latter case be too distant in time and context to be memorable when needed. This suggests the need for more targeted sex education to reach the minority who need it at a very early age, while not imposing it on the majority when not yet relevant, but this risks stigmatising particular pupils. The Healthy Respect programme addressed the challenge by linking school sex education to nearby drop-in sexual health clinics, which could be accessed when needed. However, although it led to high take up of services, primarily to access free condoms, there was virtually no impact on behaviour.

Another possible explanation for the limited impact of the interventions is that they were not delivered as intended. As summarised above, there were limitations to the delivery of SHARE, but when these were taken into account in an "on treatment analysis" it did not change the findings (Wight et al., 2002). There was no "on treatment analysis" in the other studies, but the process evaluation in the RIPPLE study suggested that better implementation would not have changed the main behavioural outcomes. In any case, if it was not possible to achieve optimum delivery of these programmes in research conditions it is most unlikely that this could be sustained if the programmes were rolled out on a large

scale.

Conclusion

The evaluations of three different sex education programmes in Britain suggest that improved sex education of a kind that can be readily sustained in British schools, whether teacher-delivered, peer-delivered, or multi-component, is unlikely to have a greater impact on sexual behaviour than that already achieved by current health promotion initiatives. The broader social factors shaping behaviour seem too influential.

Nevertheless, the role of school sex education should not be dismissed. Conventional sex education, along with other sexual health promotion, already achieves high levels of condom and contraceptive use. Moreover, the combined data from SHARE and RIPPLE studies found that sexually experienced 16 year olds were overwhelmingly positive about the subjective quality of their sexual relationships, in both the intervention and control arms (Wight et al., 2008). These positive findings should be celebrated, even if attribution is difficult. While the best available sex education should be delivered comprehensively, more research is necessary to develop ways of targeting programmes to different kinds of young people when most needed.

However, sex education needs to be complemented with much broader initiatives that acknowledge the "up stream" social determinants of sexual behaviour. Teenage pregnancy is probably the outcome least susceptible to school sex education, given that rates are shaped by poverty, educational aspirations and local views towards child bearing (Social Exclusion Unit, 1999). Evidence from these studies, and from the wider literature, point to three radically different and potentially promising approaches. First, as current government policy recognizes, poor outcomes in teen years, including sexual risk-taking, might be best tackled in the early years of children's lives, particularly when parent-child relationships are most malleable (Olds et al., 1988; Hawkins et al., 2008; Conger et al., 2000; Department for Education and Skills, 2005). Second, the clear social patterning of sexual ill health suggests that this is, in large part, the effect of underlying socio-economic factors that can only be tackled at a macro-level. Third, there is increasing evidence of the potential negative effects of sexual and violent content in the mass media and computer games (Brown et al., 2006), suggesting the need for interventions to modify media content and exposure to negative sexual images. A combination of these three approaches is likely to have a greater effect on sexual outcomes than the further improvement of sex education or sexual health services.

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