

# Primary care



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## Health promotion for adolescents in primary care: randomised controlled trial

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### Abstract

**Objectives** To evaluate the effectiveness of inviting teenagers to general practice consultations to discuss health behaviour concerns and appropriate follow up care.

**Design** Randomised controlled trial, with participants randomised to a consultation (intervention) or usual care (control). Questionnaires completed at baseline, 3 months, and 12 months.

**Setting** Eight general practices in Hertfordshire, England.

**Participants** 1516 teenagers aged 14-15 years.

**Intervention** Consultations with practice nurses to discuss health concerns and develop plans for healthier lifestyles.

**Main outcome measures** Mental and physical health, "stage of change" for health related behaviour, and use of health services.

**Results** At baseline 970 teenagers completed questionnaires; 23% smoked, 35% had been drunk in the previous three months, 64% considered they ate unhealthily, 39% took little exercise, and 36% had possible depression. 41% (304) of teenagers invited attended for a consultation; over one third (112) were offered follow up care. More intervention group teenagers reported positive movement in stage of change for diet and exercise and in at least one of four behaviours (diet, exercise, smoking, drinking alcohol) at 3 months (41% *v* 31%,  $P < 0.01$ ), but this did not persist at 12 months. There was marginally more positive change in actual behaviour by intervention teenagers at 3 months (16% *v* 12%,  $P = 0.06$ ). Recognition of possible depression resulted in improved mental health outcomes at 3 and 12 months. 97% of attenders said they would recommend the intervention to a friend.

**Conclusions** Change in behaviour was slight but encouraging, and the intervention was well received and relatively cheap.

### Introduction

Government policy in Britain is focused on preventing heart disease and stroke, accidents, cancer, and mental illness.<sup>1</sup> Adolescents have a high prevalence of risk factors associated with each of these priority areas,<sup>2</sup> but

few receive any health promotion from general practice.<sup>3-5</sup>

This paper reports the first UK randomised controlled trial to evaluate the effectiveness of inviting teenagers to general practice for a health consultation and appropriate follow up care. Our hypotheses were that the intervention would provide a useful service, enable mental and physical health problems to be identified and addressed with appropriate information, and encourage healthy lifestyles. The intervention was based on models of self efficacy and behaviour change<sup>6</sup> and teenagers' attitudes to general practice services.<sup>7-9</sup> The intervention followed the structure suggested by the American Medical Association for consultations promoting self efficacy for healthy lifestyles with adolescents<sup>10</sup> and was informed by the views of teenagers elicited from local surveys and focus groups.<sup>5</sup>

### Methods

**Participants and randomisation**—We identified teenagers aged 14 or 15 years on 1 January 1999 from eight general practice registers in Hertfordshire. The general practitioners sent letters to parents asking for consent. We then gave the teenagers a study number, stratified them according to sex, and randomised them by household, within the practice, to the intervention or control group.

**Intervention**—Teenagers in the intervention group received an appointment for a 20 minute consultation with the practice nurse to discuss their health and health related behaviour, focusing on topics of their choice. Twelve nurses received training in the study protocol, which aimed to improve adolescent self efficacy for behaviour change.<sup>6</sup> Attenders completed baseline and satisfaction questionnaires and provided saliva samples for measurement of cotinine to validate self reported smoking status. Teenagers who did not attend after two invitations were sent health promotion leaflets and baseline questionnaires at home. The control group received usual care and were sent baseline questionnaires at home. Both intervention and control teenagers were asked to complete follow up questionnaires at three months and 12 months and were invited for a consultation at 12 months to provide saliva samples for cotinine measurements. Up to three reminders

were sent for all questionnaires. We used the Center for Epidemiological Studies depression scale for children to assess mental health.<sup>11</sup>

*Analysis*—Analysis was by intention to treat, and we assumed that teenagers who completed baseline questionnaires but did not return follow up questionnaires had made no changes.

## Results

### Participant flow

See [bmj.com](http://bmj.com) for details of the progress of participants through the trial. Briefly, we randomised 1488 teenagers and collected baseline data from 970; of the 739 teenagers invited, 304 (41%) attended the consultation. At three months 378 of the intervention group and 357 of the control group completed questionnaires. At one year the 1358 teenagers remaining in the study were invited to attend a consultation; questionnaires were completed by 322 (49%) of the intervention group and 337 (48%) of the control group.

### Baseline results

*Demographic data*—Respondents were aged 14-16 years (mean 15 years); about half were male. Most (868, 89%) were white, and 466 (48%) were in professional, managerial, or technical socioeconomic groups. Six hundred and forty eight (67%) lived in privately owned accommodation.

*Physical and mental health problems*—One hundred teenagers (10%) reported a “major health problem”; asthma was the most common problem. Problems varied from sexual abuse to acne. More girls than boys reported problems—13% (64) *v* 8% (36);  $P=0.02$ ). Girls scored significantly higher than boys on the depression scale, indicating poorer mental health (17.1 *v* 11.9; 95% confidence interval for mean difference  $-6.5$  to  $-4.0$ ;  $P<0.01$ ). (A score of 16 indicates probable depression.)

*Health related behaviour*—Seven hundred and twenty six (78%) of the teenagers of the 930 teenagers who answered reported at least one of the health damaging behaviours measured (table 1), and 128 (14%) reported at least three. Girls reported significantly more health damaging behaviours than boys (mean 1.5 for girls, 1.2 for boys; 95% confidence interval for mean difference 0.25 to 0.51;  $P<0.01$ ). Increased numbers of these behaviours were associated with poorer mental health on the depression scale ( $r=0.31$ ,  $P<0.01$ ). No differences existed between intervention and control groups or between teenagers who did and did not attend.

*Sexual health knowledge*—One quarter (236, 24%) of the respondents did not know where to go for contraception without their parents knowing, and 30% (293) did not know where to get confidential advice. Almost one third (292, 30%) did not know that emergency contraception is effective for 72 hours, and two thirds (645) did not know that chlamydia is a sexually transmitted infection.

*Use of health services*—In the year before baseline, 709 (73%) of the teenagers had visited their general practitioner and 226 (23%) had visited their practice nurse at least once. Girls were significantly more likely to have visited, but there was no significant difference

**Table 1** Prevalence of self reported health related behaviour at baseline. Values are numbers (percentages)

Behaviour	Prevalence (n=970)
<b>Smoking:</b>	
Current smoker	225 (23)
Never smoked	613 (63)
<b>Alcohol:</b>	
Drinks alcohol more than once a week	98 (10)
Never drunk alcohol	231 (24)
Been drunk in past three months	342 (35)
<b>Drugs:</b>	
Has taken drugs	145 (15)
Knows someone who takes drugs	617 (64)
Has been offered drugs or encouraged to try drugs	299 (31)
Thinks will be tempted to take drugs in the future	122 (13)
<b>Diet and exercise:</b>	
Does not exercise regularly	378 (39)
Does not eat healthily	617 (64)
Believes is overweight	264 (27)
Believes is underweight	99 (10)

by age, ethnic group, or socioeconomic group. However, teenagers who had visited their general practitioner were significantly more likely to report health damaging behaviour and to have poor mental health. Forty one per cent (398) had visited their school nurse, and one fifth (202) had visited another health professional.

### Consultation

Of the 290 attenders who answered the question, three quarters (230) wished to discuss at least one health behaviour topic with a practice nurse (see [bmj.com](http://bmj.com)). A quarter (77) wished to discuss body shape and diet; 12% (35—half the smokers) wished to discuss smoking. Three quarters (225) indicated at least one behaviour they would like to work on changing; the most common were diet (144, 50%), exercise (104, 36%), dealing with stress (68, 23%), and smoking (39, 13%).

Three quarters of the teenagers set a health related behaviour target. Sixty three planned to tackle more than one area; the most common topics were diet or nutrition, exercise, and smoking. All teenagers but one were satisfied or fairly satisfied with their consultations. Most said they had felt able to talk about all the issues they wanted to, about half found the consultation better than they had expected, most thought the consultation was very useful or fairly useful, and 97% would recommend the service to a friend.

The nurses identified 48 (16%) teenagers as having some mental health problems, such as anxieties related to family, school, or friends. They identified 12 (4%) as likely to be depressed and a further 17 (6%) as possibly depressed; 21 teenagers were offered mental health follow up care.

Overall, more than one third (112) of the teenagers were offered follow up care (see [bmj.com](http://bmj.com)). Observation of a sample of clinics confirmed that the nurses were following the protocol, explaining the code of confidentiality, and trying to build a rapport with the teenagers. Mean length of consultations was 23 (SD 9) minutes.

### Follow up

*Health related behaviour*—At three months marginally more teenagers in the intervention group than in

**Table 2** Number (percentage) of teenagers in intervention and control groups who reported positive behaviour change at three month follow up

Positive change at three months	Intervention group (n=504)	Control group (n=466)	$\chi^2$	df	P
Diet	21 (4.2)	10 (2.1)	3.20	1	0.07
Exercise	18 (3.6)	12 (2.6)	0.80	1	0.37
Smoking	33 (6.5)	23 (4.9)	1.16	1	0.28
Drinking	32 (6.3)	22 (4.7)	1.22	1	0.27
Any of four areas	82 (16.3)	56 (12.0)	3.59	1	0.06

the control group reported positive change in at least one of the four areas of health related behaviour (16% v 12%; P=0.06) (table 2). No significant difference existed at 12 months.

*Stage of change for health related behaviour*—At three months significantly more of the teenagers in the intervention group (206, 41%) than in the control group (143, 31%) indicated some positive movement in stage of change for at least one of the four key behaviours (see [bmj.com](http://bmj.com)). No significant difference existed at 12 months.

*Change in mental health score*—We found no significant difference in change in mental health score overall between intervention and control group teenagers at three or 12 months. However, attending teenagers who scored 16 or more on the depression scale and who were identified by a nurse as having possible depression reduced their mental health score significantly more than did controls with these scores. The difference was significant both at three months (−8.1 intervention v −1.4 control; 95% confidence interval for mean difference −0.3 to −13.3; P=0.04) and at one year (−1.6 v 4.4; −0.5 to −11.5; P=0.03), indicating significantly improved mental health relative to controls.

*Use of health services*—Significantly more of the teenagers who were offered follow up had returned to the practice within three months compared with those offered no specific follow up—41% (46) v 28% (54); P=0.03). In the follow up year intervention group teenagers reported fewer visits to their general practitioner than did controls (1.7 v 2.1; P=0.06). No difference existed between groups in the number of visits to practice nurses or school nurses. At 12 months significantly more intervention group teenagers than controls knew where to go for confidential advice (83% (257) v 77% (249); P=0.04) and for information on contraception (88% (273) v 80% (259); P=0.02).

## Discussion

The results of the trial are disappointing in that benefits (even where significant) were small. In this the results confirm the findings of trials of health promotion among adults and suggest that more needs to be offered to make a real difference.<sup>12 13</sup> However, although the sample size was met, the analysis by intention to treat and assumptions of no change for the considerable number of non-responders is likely to have resulted in a considerable underestimate of the real effects of the intervention, especially at 12 months, when non-response was highest. Considering these factors, and that changing behaviour is notoriously difficult, the results provide an encouraging start, in terms of both actual behaviour change and stage of change. They suggest the need for a larger study with greater

power as well as a more sustained intervention to help to maintain the short term gains and the positive intentions.

The trial confirmed the broad range of topics that adolescents would like the opportunity to discuss with a health professional. Nearly three quarters of teenagers visit their general practitioner each year—over half attend by themselves<sup>14</sup>—and these visits provide an opportunity to develop an adult relationship with health professionals and to discover the range of services available through the NHS. Confidentiality is a major issue that may stop this age group seeking advice, and teenagers in the intervention group were better informed at one year about access to confidential information, especially concerning sexual health. In consultations, neither teenagers nor health professionals raise many of the topics of concern to teenagers,<sup>15</sup> but if topics have been previously discussed teenagers are more willing to discuss them again.<sup>16</sup> If, as in this intervention, health professionals initiate discussion on sensitive issues and health promotion, teenagers may feel more able to raise such concerns on future occasions when they need to.

Recruitment to behaviours with health risks tends to be high at this age, so any reduction in uptake is important. Nurses expected to discuss sexual and mental health, drugs, and alcohol, and the teenagers did raise these concerns. But teenagers' greatest concern was about diet and exercise, both important factors in heart disease and stroke, while half the smokers wished to discuss smoking.

Interest in training about teenage health issues is increasing,<sup>17</sup> but no specific financial incentives for adolescent care are available, and a recent survey reported that only one in 10 health authorities had a policy on adolescents.<sup>18</sup> The intervention reported in this study was brief and inexpensive and possibly offset by reduced consultations in the following year. With minor financial outlay and some publicising of policies on confidentiality, practices can at least create an atmosphere that welcomes teenagers.

### What is already known on this topic

Teenagers have a high prevalence of health damaging behaviour and have expressed a wish to discuss a broad range of health related issues with a health professional

Few teenagers receive health promotion advice or information from their general practice teams

### What this study adds

General practice based health promotion consultations are welcomed by teenagers who attend

Such consultations provide an effective opportunity to identify and tackle mental and physical health problems and encourage healthy lifestyles

The effect on teenagers' actual lifestyles is modest

## Conclusion

The consultations enabled the mental and physical health concerns of adolescents to be identified and addressed, were well received, and helped the teenagers to develop healthier lifestyles. A larger study with more substantial intervention is needed.

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## Corrections and clarifications

*Psychological stress and cardiovascular disease: empirical demonstration of bias in a prospective observational study of Scottish men*

The authors of this article, John Macleod and colleagues (25 May, pp 1247-51), have alerted us to an error in one of the headings in table 2 in the version on bmj.com. (The table did not appear in the shorter version of the paper in the print journal.) The heading "Hazard ratio (95% confidence interval)" should read "Rate ratio (95% confidence interval)."

*Birth weight of offspring and insulin resistance in late adulthood: cross sectional survey*

The authors of this paper, Debbie A Lawlor and colleagues (17 August, pp 359-62), have alerted us to an error in the results section. The first sentence of the fourth paragraph should read: "The odds of maternal insulin resistance (top quarter of HOMA score [not "birth weight"] compared with lowest three quarters [not "all other participants"], adjusted by age) decreased with increasing birth weight of offspring (odds ratio 0.85; 95% confidence interval 0.71 to 1.00)." The HOMA score is the homeostasis model assessment score.

*Book review*

In Harold Ellis's review of the book *Civil War Medicine: Challenges and Triumphs* by Alfred Jay Bollet (20 July, p 170), an error in the original submission persisted to publication. One of the films referred to in the second paragraph is *Dances With Wolves* [not *Run With the Wolves*].

## A memorable teacher

You learn better from a teacher who sets an example and leads from the front rather than one who merely spouts theory. I learnt many lessons, in the space of half an hour, from Dr Farokh Udwardia, professor of medicine at Grant Medical College and the Sir JJ Group of Hospitals in Bombay, when I was an undergraduate in the mid-1980s.

At a clinical meeting in early 1986, after the first case had been presented, Dr Udwardia walked out of the seminar room and returned a few moments later, leading a patient by her hand. The patient was a young woman, probably in her mid-20s. While the audience was wondering what this was leading to—why was the professor bringing her in when he had hordes of residents to do it?—I realised what disease the patient had and why Dr Udwardia was making a point of holding her hand to lead her in. This was the first patient with AIDS that we had in JJ Hospital and among the first few cases in India. The point that Dr Udwardia made was clear: although AIDS was, then, just appearing on the horizon and we were all interested in seeing such patients—learning the symptoms, signs, and the pathology—it was imperative not to treat

the patients like exhibits. They were human beings and deserved, and needed, to be treated as such.

Was I the only person who learnt this lesson? Last year, during a talk on patients' rights at a seminar on medical ethics, I referred to this incident as one that had left a strong impression on my mind. To my pleasant surprise, a doctor from the audience stood up and said that he, too, was present that day and remembered the event distinctly.

That was not the only thing I learnt on that day. Earlier, while my friend and I were waiting for the lift on the ground floor, we saw the professor dash past us and charge up the stairs to the seminar hall on the sixth floor. As we sheepishly followed him, he taught me two other lessons—never be late for a meeting and, as I read in the *Journal of Clinical Pathology* (1995;48:1075-7) years later as a pathology resident, "lifts are for wimps."

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