
**Research question**
Does inviting teenagers to general practice health consultations and appropriate follow-up care regarding healthy lifestyles result in behaviour change?

**Type of article and design**
Randomized controlled trial.

**Relevance to family physicians**
Family physicians spend a great deal of time and energy on preventing heart disease and stroke, accidents, cancer, and mental illness. Adolescents have many risk factors associated with each of these areas and have identified a range of issues that they would like to discuss with health professionals.

Consultations with adolescents are usually shorter than for other age groups, and adolescents' medical records often contain little information. There are few published reports of screening or health promotion among adolescents in family practice settings. In the United States, adolescent medicine became a subspecialty in 1994, but in Britain and Canada, adolescents are usually cared for by general practitioners and family physicians. Teenagers often behave in ways that put them at risk, and family physicians, though sometimes uneasy with these patients or short of time, should be aware of various effective strategies for health promotion in this population.

**Overview of study and outcomes**
This British Hertfordshire trial randomly assigned 1488 14- and 15-year-old adolescents (mean age 14.8 years; 49% males; 89% white; 48% from families in professional, managerial, or technical socioeconomic groups; 67% living in privately owned homes; and 73% living with both natural parents) after parental consent to intervention or control groups. The intervention was based on the American Medical Association's structure for consultations promoting self-efficacy for healthy lifestyles with adolescents. Teenagers’ views were elicited from local surveys and focus groups.

The intervention group were invited to a 20-minute consultation with a practice nurse to discuss their health and health-related behaviours, focusing on topics of their choice. They completed baseline and satisfaction questionnaires. Those who did not attend after two invitations were sent health-promotion leaflets and baseline questionnaires at home. Teenagers in the control group received usual care and were sent baseline questionnaires at home. Both intervention and control groups were asked to complete follow-up questionnaires at 3 and 12 months and were invited to a consultation at 12 months. Mental and physical health, “stage of change” for four health-related behaviours (diet, exercise, smoking, and drinking), and use of general practice services of the two groups were compared. Primary outcomes were self-reported health behaviour change and positive movement along a stage-of-change continuum for health-related behaviours at 12 months. Secondary outcomes were the same outcomes assessed at 3 months after the intervention.

**Results**
Of 739 adolescents invited to baseline consultations, 304 (41%) attended: 49% of the girls and 35% of the boys. A further 200 study subjects and 466 controls completed baseline questionnaires at home. At 3 months, 378 study subjects and 357 controls completed questionnaires.
At 1 year, the 1358 adolescents remaining in the study were invited to attend consultations; 29% attended. Nonresponders were sent questionnaires at home. Questionnaires were completed by 322 (49%) study subjects and 337 (48%) controls. Overall, 100 (10%) teenagers reported major health problems. Asthma was the most common problem. More girls than boys reported problems (13% vs 8% \( P = .02 \)). Girls scored significantly higher than boys on the depression scale, indicating they had poorer mental health.

Unhealthy behaviour was similar at baseline in both groups and among attenders and nonattenders. At baseline, 23% of study adolescents smoked, 10% drank alcohol more than once a week, 35% had been drunk in the past 3 months, 15% had taken drugs, 39% had not exercised regularly, 64% had not eaten healthily, and 27% believed themselves overweight. Girls reported significantly more unhealthy behaviour than boys \( (P < .01) \); more unhealthy behaviour correlated with higher scores on the depression scale.

Study teenagers knew little about contraception or chlamydia as a sexually transmitted disease.

In the year before baseline, 73% of teenagers had visited a family practitioner, and an additional 23% a practice nurse. Nearly 80% of those who attended consultations wanted to discuss at least one health-related topic, most commonly body size or shape (27%), acne (27%), diet (26%), exercise (21%), and stress. Three quarters identified at least one behaviour they would like to work on changing, most commonly diet, exercise, dealing with stress, and smoking. In general, the teenagers reported satisfaction with being able to talk about the issues they wanted to and with the consultation. More than a third were offered follow-up care for issues identified at the consultation.

At 3 months, marginally more study subjects than controls reported positive change in at least one of the four areas of health-related behaviour (16.3% vs 12.0%, \( P = .06 \)). Although intervention teenagers reported significantly more positive movement in each case \( (\text{Table 1}) \), there was no significant difference between intervention and control groups in reported unhealthy behaviours at 3 months. Number needed to treat to effect positive behaviour change at 3 months was 23 (95% confidence interval [CI] 12 to \( \infty \)). No statistically significant difference persisted at 12 months. Significantly more teenagers offered follow-up than not offered follow-up had returned to the practice within 3 months.

### Table 1. Reported positive movement along a stage-of-change continuum: Comparison at 3-month follow-up visit.

<table>
<thead>
<tr>
<th>BEHAVIOUR</th>
<th>INTERVENTION GROUP</th>
<th>CONTROL GROUP</th>
<th>( P ) VALUE (95% CONFIDENCE INTERVAL)</th>
<th>NUMBER NEEDED TO TREAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet</td>
<td>89 (17.6)</td>
<td>55 (11.8)</td>
<td>.01 (10-75)</td>
<td>17</td>
</tr>
<tr>
<td>Exercise</td>
<td>86 (17.1)</td>
<td>54 (11.6)</td>
<td>.01 (10-92)</td>
<td>18</td>
</tr>
<tr>
<td>Smoking</td>
<td>41 (8.1)</td>
<td>25 (5.4)</td>
<td>.09 (17-6)</td>
<td>37</td>
</tr>
<tr>
<td>Drinking</td>
<td>65 (12.9)</td>
<td>61 (13.1)</td>
<td>.93 (23-p)</td>
<td>500</td>
</tr>
<tr>
<td>Any of the four areas</td>
<td>206 (40.9)</td>
<td>143 (30.6)</td>
<td>&lt;.01 (6-23)</td>
<td>10</td>
</tr>
</tbody>
</table>

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### Analysis of methodology

This was a relatively well designed study. Sample size estimates were met, and analysis was by intention to treat. Intervention and control groups were similar at the start of the trial. Assuming no change in behaviour among the considerable number of nonresponders (66%), however, might have led to underestimation of the true effects of intervention, which would be most obvious at 12 months when nonresponse was greatest.

Adolescents from eight different general practice registers in Hertfortshire were included in this study; results might not be generalizable to other geographic and socioeconomic situations. Reported smoking rates of 23% were higher than the 19% rate for 15- to 17-year-olds in Canada.\(^1\) Due to the nature of the intervention, adolescents could not be blinded to their group, but both groups received identical questionnaires, and coding and data entry were blinded to intervention status.

All outcomes were self-reported; the only data validated concerned smoking status (using saliva cotinine levels). Specially trained nurses spent an average of 22 minutes with each teenager. This could have led to a Hawthorne effect, where teenagers might have altered their behaviour just because they knew they were being studied. Because the whole sample came from practices in Hertfortshire, there might have been a clustering effect.

### Application to clinical practice

Grade A recommendations of the Canadian Task Force on the Periodic Health Examination\(^8\) for adolescents include preventive counseling on injury prevention, alcohol and driving, seatbelt use, dental hygiene, hepatitis B and tetanus immunization, and varicella immunization for susceptible adolescents.

Grade B recommendations include counseling on helmet use, smoking, sexual practices and sexually transmitted diseases, contraception, sun exposure, physical activity, household and recreational injury, gingivitis, and periodontal disease. They also include screening for children of alcoholics and for problem drinking.
Grade C recommendations are for scoliosis, child maltreatment, and body mass index with a view to treating or preventing obesity. Also included are screening non-pregnant adolescents for hemoglobinopathy carrier status, HIV counseling, and screening for testicular cancer.

Grade D recommendations include screening for depression. The American Medical Association has Guidelines for Adolescent Preventive Services (GAPS) that recommend annual visits from age 11 to 21. The GAPS program has 24 recommendations summarized on a user-friendly health service record (GAPS-HSR) that you could use in your practice. The GAPS guidelines are criticized for being based on expert opinion rather than good evidence. Because most physicians spend less time with adolescents than with any other age group, relatively little health-promotion advice is recorded in adolescents’ charts.

Health services need to be responsive to their adolescent patients. Positive aspects identified by adolescents were “friendly staff” and “friendly atmosphere” as compared with “too quiet and morbid in the waiting room.” Teenagers rated confidentiality first, anonymous access to advice by telephone second, and good written information third when they ranked primary care facilities. None of these is expensive to implement. Follow-up telephone calls after written invitations to attend preventive health visits result in increased participation. Information about smoking signed by their doctors and mailed to adolescent patients substantially reduced smoking uptake and proved influential and cost effective.

Even rigorous intervention sometimes fails to produce desired outcomes. In this study, specially trained nurses spent an average of 22 minutes with each teenager. That is about three times the duration of an average visit with a doctor. Despite that, no statistically significant difference in behaviour persisted at 12 months after the intervention. This raises the question of whether adolescent health promotion is worth the time and cost. Coordinated prevention interventions with rigorous follow up will be required to bring about change in adolescents' behaviour.

**Bottom line**
- Teenagers have a high prevalence of unhealthy behaviour. This study showed that health promotion consultations in general practice are welcomed by teenagers.
- Such consultations provide an effective opportunity for identifying and addressing mental and physical health issues and encouraging healthy lifestyles.
- Adapting family medicine settings can make them comfortable for adolescents and inviting adolescents to visit by telephone, letter, or information sheets could be effective in promoting healthy behaviour to adolescents.
- Even rigorous intervention sometimes fails to produce desired outcomes in adolescents, which raises the question of whether it is worth the time and cost.

**Points saillants**
- Il existe une forte prévalence de comportements malsains chez les adolescents. Cette étude a démontré que les consultations de promotion de la santé en pratique générale sont accueillies favorablement par les adolescents.
- De telles consultations offrent une occasion propice pour identifier les problèmes de santé physique et mentale, transiger avec ces derniers et encourager des modes de vie sains.
- Pour promouvoir auprès des adolescents l'adoption de comportements sains, il pourrait se révéler efficace d'adapter les milieux de médecine familiale pour que les adolescents s'y sentent à l'aise et d'inviter les jeunes par téléphone, lettre ou feuillet d'information à venir consulter.
- Même une intervention rigoureuse ne donne parfois pas les résultats escomptés chez les adolescents, ce qui remet en question s'il la valeur du temps et de l'argent qui y sont consacrés.

**References**