Teenage pregnancy and social disadvantage: systematic review integrating controlled trials and qualitative studies

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ABSTRACT

Objectives To determine the impact on teenage pregnancy of interventions that address the social disadvantage associated with early parenthood and to assess the appropriateness of such interventions for young people in the United Kingdom.

Design Systematic review, including a statistical meta-analysis of controlled trials on interventions for early parenthood and a thematic synthesis of qualitative studies that investigated the views on early parenthood of young people living in the UK.

Data sources 12 electronic bibliographic databases, five key journals, reference lists of relevant studies, study authors, and experts in the field.

Review methods Two independent reviewers assessed the methodological quality of studies and abstracted data.

Results Ten controlled trials and five qualitative studies were included. Controlled trials evaluated either early childhood interventions or youth development programmes. The overall pooled effect size showed that teenage pregnancy rates were 39% lower among individuals receiving an intervention than in those receiving standard practice or no intervention (relative risk 0.61; 95% confidence interval 0.48 to 0.77). Three main themes associated with early parenthood emerged from the qualitative studies: dislike of school; poor material circumstances and unhappy childhood; and low expectations for the future. Comparison of these factors related to teenage pregnancy with the content of the programmes used in the controlled trials indicated that both early childhood interventions and youth development programmes are appropriate strategies for reducing unintended teenage pregnancies. The programmes aim to promote engagement with school through learning support, ameliorate unhappy childhood through guidance and social support, and raise aspirations through career development and work experience. However, none of these approaches directly tackles all the societal, community, and family level factors that influence young people’s routes to early parenthood.

Conclusions A small but reliable evidence base supports the effectiveness and appropriateness of early childhood interventions and youth development programmes for reducing unintended teenage pregnancy. Combining the findings from both controlled trials and qualitative studies provides a strong evidence base for informing effective public policy.

INTRODUCTION

Countries such as the United Kingdom and the United States have high teenage pregnancy rates relative to other countries.1-3 Although teenage pregnancy can be a positive experience, particularly in the later teenage years,4 it is associated with a wide range of subsequent adverse health and social outcomes.5-7 These associations remain after adjusting for pre-existing social, economic, and health problems.8 Despite the establishment of a national teenage pregnancy strategy in 1999,9 teenage birth rates in the UK are the highest in western Europe10 and conceptions among girls under 16 years of age in England and Wales have increased since 2006.11

Recent research evidence shows that traditional approaches to reducing teenage pregnancy rates—such as sex education and better sexual health services—are not effective on their own.12,13 This evidence has generated increased interest in the effects of interventions that target the social disadvantage associated with early pregnancy and parenthood.14-19 Social disadvantage refers to a range of social and economic difficulties an individual can face—such as unemployment, poverty, and discrimination—and is distributed unequally on the basis of sociodemographic characteristics such as ethnicity, socioeconomic position, educational level, and place of residence.20-21

The objectives of this study were to determine on the basis of evidence in qualitative and quantitative research the impact on teenage conceptions of interventions that address the social disadvantage associated with early parenthood and to assess the appropriateness of such interventions for young people in the UK.

METHODS

We undertook a three part systematic review of the research evidence on social disadvantage and pregnancy in young people by using an innovative method we developed previously for integrating qualitative and quantitative research.22-24 The first part of the review
focused on quantitative controlled trials and was
designed to assess the impact on teenage conceptions
of interventions that address the social determinants
of teenage pregnancy. The second part focused on qual-
itative research and examined intervention need and
appropriateness on the basis of the perspectives and
experiences of young people. In the third part of the
review, we integrated the two sets of findings to assess
the extent to which existing evaluated interventions do
in fact address the social disadvantage associated with
early pregnancy and parenthood as determined by the
needs and concerns of young people.

The inclusion of qualitative research in systematic
reviews facilitates the incorporation of “real life”
experiences into evidence based policy making.24 An
ability to unpack the worldview of participants at a particular
time and location has been highlighted as a key
strength of qualitative research.25 26 Although we
included trials conducted in any country, we drew
only on qualitative studies conducted in the UK to
help assess the applicability of interventions to reduce
teenage pregnancy within this country in particular.

Search strategy
Our literature searches covered seven major databases
and five specialist registers (table 1). Highly sensitive
topic based search strategies were designed for each
database. We did not use study type search filters and
identified controlled trials and qualitative studies using
the same strategy.

We included randomised and non-randomised con-
trolled trials that evaluated interventions designed to
target social disadvantage and that reported teenage
conceptions or births as an outcome measure. The
inclusion of trials was not restricted according to lan-
guage, publication date, or country. We included any
qualitative study published between 1994 and 2004
that focused on teenage pregnancy and social disad-
vantage among young people aged less than 20 years
old living in the UK.

Relevant interventions were those that aimed to
improve young people’s life opportunities and finan-
cial circumstances; for example, through educational
or income support. Relevant interventions could be
targeted at children, young people, or their families.
Controlled trials of sex education or sexual health ser-
vice and qualitative studies focusing solely on atti-
dudes to and knowledge of sexual health or sex
education were excluded.

We hand searched American Journal of Public Health
(from January 1999 to January 2004), Journal of Adoles-
cent Health (from January 1999 to February 2004), Jour-
nal of Adolescence (from February 1999 to April 2004),
and Perspectives on Sexual and Reproductive Health
(from issue 1, 1999, to issue 1, 2004). We also reviewed the
reference lists of all studies that met our inclusion
criteria and contacted experts in the field who suggested
further studies to pursue.

Quality assessment
We assessed the extent to which controlled trials had
minimised bias and error in their findings by using a set
of criteria developed in previous health promotion
reviews.27-29 “Sound” trials were those that reported
data on each outcome measure indicated in the study
aims; used a control or comparison group equivalent to
the intervention group on relevant sociodemographic
measures or, in cases with non-equivalent groups,
adjusted for differences in the analysis; provided
pre-intervention data for all individuals in each
group; and provided post-intervention data for all indi-
viduals in each group.

The criteria we used to assess the methodological
quality of the qualitative studies were built on those sug-
gested in the literature on qualitative research.26 30-33
Each study was assessed according to 12 criteria
designed to aid judgment on the extent to which study
findings were an accurate representation of young
people’s perspectives and experiences (box). A final
assessment sorted studies into one of three categories on
the basis of quality: high quality (those meeting 10 or more
criteria), medium quality (those meeting between seven
and nine criteria), and low quality (those meeting fewer
than seven criteria).

Data extraction
We used a standardised tool to extract from “sound”
controlled trials information on the development and
content of the intervention evaluated, the population
involved, and the trial design and methods.34 Data
to calculate effect sizes for pregnancy and birth rates were
identified from study reports and via contact with study
authors if data were incomplete or not in an appropri-
ate form.

Data on the development, design, methods, and the
populations involved were extracted from the qualita-
tive studies in a standardised way by using an estab-
lished tool designed for a broad range of study
types.35 The findings of the qualitative studies were
identified within the “findings” or “results” sections of
study reports and exported verbatim into NVivo

Table 1 | Major databases and specialist registers searched

<table>
<thead>
<tr>
<th>Major commercial databases</th>
<th>Time period of search</th>
<th>Date searched</th>
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<tbody>
<tr>
<td>PubMed (includes Medline and old Medline)</td>
<td>January 1950-June 2004</td>
<td>June 2004</td>
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<tr>
<td>Embase</td>
<td>January 1981-June 2004</td>
<td>June 2004</td>
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<tr>
<td>Cumulative Index to Nursing and Allied Health Literature (CINAHL)</td>
<td>January 1982-May 2004</td>
<td>May 2004</td>
</tr>
<tr>
<td>Education Resources Information Center (ERIC)</td>
<td>January 1985-April 2004</td>
<td>April 2004</td>
</tr>
<tr>
<td>PsycINFO</td>
<td>January 1988-May 2004</td>
<td>May 2004</td>
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</table>

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<tr>
<th>Specialist registers</th>
<th>Time period of search</th>
<th>Date searched</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence for Policy and Practice Information Centre Register of Health Promotion and Public Health Research (BiblioMap)</td>
<td>All years available</td>
<td>April 2004</td>
</tr>
<tr>
<td>Cochrane Central Register of Controlled Trials (CENTRAL)</td>
<td>All years available</td>
<td>May 2004</td>
</tr>
<tr>
<td>National Research Register (NRR)</td>
<td>All years available</td>
<td>March 2004</td>
</tr>
<tr>
<td>Health Promotion Library for Scotland (HPLS)</td>
<td>All years available</td>
<td>March 2004</td>
</tr>
<tr>
<td>Health Development Agency Register (Health Promis)</td>
<td>All years available</td>
<td>April 2004</td>
</tr>
</tbody>
</table>

All sources searched were used to identify both quantitative and qualitative studies.
Criteria used to assess the quality of qualitative studies

**Quality of reporting**
- Were the aims and objectives clearly reported?
- Was there an adequate description of the context in which the research was carried out?
- Was there an adequate description of the sample and the methods by which the sample was identified and recruited?
- Were there an adequate description of the methods used to collect data?
- Was there an adequate description of the methods used to analyse data?

**Use of strategies to increase reliability and validity**
- Were there attempts to establish the reliability of the data collection tools (for example, by use of independent coders)?
- Were there attempts to establish the validity of the data analysis methods (for example, pilot interviews)?
- Were there attempts to establish the reliability of the data analysis methods (for example, by use of independent coders)?
- Were there attempts to establish the validity of data analysis methods (for example, by searching for negative cases)?

**Extent to which study findings reflected young people’s perspectives and experiences**
- Did the study use appropriate data collection methods for helping young people to express their views?
- Did the study use appropriate methods for ensuring the data analysis was grounded in the views of young people?
- Did the study actively involve young people in its design and conduct?

Thirdly, we constructed a methodological and conceptual matrix to integrate the findings of the two syntheses. The potential implications of young people’s views for interventions to prevent teenage pregnancy were laid out alongside the content and findings of the soundly evaluated interventions.

Screening of full reports against inclusion criteria, quality assessment, data extraction, and data synthesis were all carried out by pairs of reviewers working independently at first and then together. Initial screening of titles and abstracts was done by single reviewers after a period of double screening to ensure consistency across reviewers.

**RESULTS**

**Study characteristics and quality**
Ten controlled trials\(^1\)\(^-\)\(^10\) and five qualitative studies\(^11\)\(^-\)\(^15\) met our inclusion criteria. Six controlled trials were judged to be of sufficient methodological quality to provide reliable evidence about the impact of interventions on teenage pregnancy rates.\(^1\)\(^1\)\(^-\)\(^3\)\(^w\)\(^6\)w\(^7\)w\(^9\)
All these trials were conducted in the US and targeted disadvantaged groups of children and young people (tables 2 and 3).

Each of the methodologically sound controlled trials evaluated one of two intervention types: (a) an early childhood intervention, or (b) a youth development programme. Three studies evaluated early childhood interventions that aimed to promote cognitive and social development through preschool education, parent training, and social skills training.\(^1\)\(^2\)w\(^3\)w\(^7\)Two of these studies—the Perry Pre-school Program\(^2\) and the Abecedarian Project\(^3\)—evaluated the long term effects of preschool education and parenting support interventions; the third—the Seattle Social Development Project—evaluated the long term effects of a school based social skills development intervention for children and their parents.\(^7\)

A further three studies evaluated youth development programmes that aimed to promote self esteem, positive aspirations, and a sense of purpose through vocational, educational, volunteering, and life skills work.\(^1\)\(^1\)w\(^5\)w\(^6\)w\(^7\)w\(^9\) Two of these studies—Teen Outreach\(^4\) and the Quantum Opportunities Program\(^5\)—evaluated after school programmes based on the principle of “serve and learn,” in which community service is combined with student learning and educational support; the third—the Children’s Aid Society Carrera-Model Program—evaluated a comprehensive academic and social development intervention delivered in youth centres, which included work experience, careers advice, academic support, sex education, arts workshops, sports, and other activities.\(^7\)

In each trial, the control group received no intervention or standard education. The four controlled trials that were deemed not to be of sufficient quality also evaluated youth development programmes in the US.\(^4\)w\(^5\)w\(^8\)w\(^9\) All five qualitative studies were judged to be of medium or high quality.\(^11\)w\(^15\) These studies included participants from a range of areas throughout the UK and used individual interviews, focus groups,
eight schools were recruited into the study. Children in these schools formed a new control group. Programme for four years. At the end of four years, children in both the intervention and the control group received the programme for two years. Additional schools matched to the original.

*This study began as a randomised, controlled trial: students within eight schools were randomised into intervention or control groups, and those in the intervention group received the

Hahn et al, 1994w6 USA Randomised,

Campbell et al, 2002w3 USA Randomised,

Philliber et al, 2001w10 USA Randomised,

Table 2

<table>
<thead>
<tr>
<th>Authors</th>
<th>Country</th>
<th>Study design</th>
<th>Sample size</th>
<th>Gender</th>
<th>Age range</th>
<th>Socioeconomic position</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen et al, 1997w1</td>
<td>USA</td>
<td>Randomised, controlled trial</td>
<td>I=342; C=353</td>
<td>Male=15%; Female=85%</td>
<td>14-15 years</td>
<td>Authors describe sample as &quot;high risk,&quot; with 54% living in one parent households and 46% living in two parent households.</td>
<td>Authors report &quot;black&quot;=67%; &quot;white&quot;=19%; &quot;Hispanic&quot;=11%; &quot;other&quot;=3%</td>
</tr>
<tr>
<td>Bernueta-Clement et al, 1984w7</td>
<td>USA</td>
<td>Randomised, controlled trial</td>
<td>I=58; C=65</td>
<td>Male=60%; Female=40%</td>
<td>3-4 years</td>
<td>Authors describe sample as children from families of low socioeconomic status.</td>
<td>Authors report sample to be 100% &quot;black&quot;</td>
</tr>
<tr>
<td>Campbell et al, 2002w7</td>
<td>USA</td>
<td>Randomised, controlled trial</td>
<td>I=53; C=51</td>
<td>Male=49%; Female=51%</td>
<td>0-4 years</td>
<td>Authors state sample was &quot;high risk&quot; from &quot;impoorished households&quot;.</td>
<td>Authors describe sample as all &quot;African-American&quot;</td>
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<tr>
<td>Hahn et al, 1994w8</td>
<td>USA</td>
<td>Randomised, controlled trial</td>
<td>I=125; C=125</td>
<td>Male=47%; Female=53%</td>
<td>14-17 years</td>
<td>Authors describe sample as recruited from list of families receiving public assistance.</td>
<td>Authors report &quot;white&quot;=15%; &quot;black&quot;=76%; &quot;Hispanic&quot;=7%; &quot;Asian&quot;=1%; &quot;other&quot;=2%</td>
</tr>
<tr>
<td>Hawkins et al, 1999w7</td>
<td>USA</td>
<td>Controlled trial*</td>
<td>I (full)=156; I (late)=267; C=220</td>
<td>Male=50%; Female=50% (approx)</td>
<td>6-12 years</td>
<td>Authors note that more than 56% participated in National School Lunch/Breakfast program.</td>
<td>Authors report &quot;white&quot;=44%; &quot;African-American&quot;=26%; &quot;Asian-American&quot;=24%; &quot;Native American&quot;=5%; &quot;other&quot;=3%</td>
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<tr>
<td>Philliber et al, 2001w10</td>
<td>USA</td>
<td>Randomised, controlled trial</td>
<td>I=589; C=574</td>
<td>Male=45%; Female=55%</td>
<td>13-15 years</td>
<td>Authors report almost half of young people come from families with at least one unemployed adult.</td>
<td>Authors report &quot;African-American&quot;=43%; &quot;Caribbean-black&quot;=3%; &quot;Hispanic&quot;=29%; &quot;white&quot;=5%; &quot;Asian&quot;=4%; &quot;bi/multiethnic&quot;=14%; &quot;other&quot;=2%</td>
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and self completion questionnaires to collect data (table 4). Four studies focused on, or included, the views of young parents, but only two of these studies included the views of young fathers as well as young mothers.

Quantitative studies of the effects of interventions on teenage pregnancy rates

Of the six controlled trials deemed to be of sufficient methodological quality, four measured pregnancy rates reported by young women, three measured partner pregnancy rates reported by young men, and two measured birth rates reported by young men and young women separately or together. The four controlled trials measuring pregnancy rates reported by young women were included in two random effects meta-analyses: one that assessed the effects of interventions on teenage pregnancies reported by young women and a second that measured the effects of interventions on teenage pregnancies reported by young men. The findings of the two controlled trials that measured birth rates were not subject to meta-analysis, but their findings are summarised after each meta-analysis. Tests revealed no statistical heterogeneity between the studies, suggesting that it would be appropriate to pool the effect sizes. However, effect sizes for youth development interventions and early childhood

![Fig 1] Forest plot showing the effect of youth development programmes and early childhood interventions on pregnancy rates reported by young women.

<table>
<thead>
<tr>
<th>Youth development programmes</th>
<th>Effect (95% CI)</th>
<th>Weight (%)</th>
<th>Sample size</th>
<th>Effect (95% CI)</th>
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<tbody>
<tr>
<td>Allen et al, 1997w1</td>
<td>0.43 (0.23 to 0.84)</td>
<td>13.0</td>
<td>570</td>
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<td>Philliber et al, 2001w10</td>
<td>0.59 (0.42 to 0.85)</td>
<td>43.9</td>
<td>519</td>
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<tr>
<td>Overall</td>
<td>0.55 (0.40 to 0.76)</td>
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<tr>
<td>Early childhood interventions</td>
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<tr>
<td>Bernueta-Clements et al, 1984w7</td>
<td>0.72 (0.44 to 1.18)</td>
<td>22.7</td>
<td>49</td>
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</tr>
<tr>
<td>Hawkins et al, 1999w7</td>
<td>0.65 (0.38 to 1.09)</td>
<td>20.5</td>
<td>171</td>
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<tr>
<td>Overall</td>
<td>0.68 (0.48 to 0.98)</td>
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<tr>
<td>Overall youth development programmes and early childhood interventions</td>
<td>0.61 (0.48 to 0.77)</td>
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education interventions were pooled separately in recognition of the differences between these two types of intervention.

The pooled effect size from the first meta-analysis showed that early childhood interventions and youth development programmes reduced teenage pregnancy rates among young women (RR 0.61, 95% CI 0.48 to 0.77; fig 1). The effect of an early childhood intervention on birth rates reported by young women was similar in the study by Campbell and colleagues (0.56, 0.42 to 0.75).

The effect of these interventions on pregnancies reported by young men is less clear (fig 2). The pooled effect size from the second meta-analysis showed that young men who had received an early childhood or youth development intervention reported fewer partner pregnancies than those who had not, but this result was not statistically significant (RR 0.59, 95% CI 0.34 to 1.02).

Hahn and colleagues evaluated a youth development programme and measured birth rates reported by both young women and young men. The intervention reduced the birth rate by 36%, although this result was of borderline statistical significance (RR 0.64, 95% CI 0.40 to 1.03).

**Qualitative studies of the views and experiences of young people**

Three major themes relating to teenage pregnancy emerged from the findings of the five qualitative studies: dislike of school; poor material circumstances and unhappy childhood; and low expectations and aspirations for the future (fig 3).

Dislike of school was a key aspect of young parents’ accounts of their lives before becoming parents and of becoming teenage parents (for example, “Still be at school? I’d rather have a baby than that. I just didn’t like school, it was hard, it was horrible”). The reasons young people gave for disliking school varied (fig 3). Some related to the subject matter taught in school, which was seen as boring or irrelevant, especially for young women

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### Table 3 | Characteristics of the interventions in the six ‘sound’ trials

<table>
<thead>
<tr>
<th>Authors</th>
<th>Intervention name</th>
<th>Intervention type</th>
<th>Intervention objectives</th>
<th>Setting</th>
<th>Provider</th>
<th>Length</th>
<th>Protocol</th>
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<tbody>
<tr>
<td>Allen et al, 1997&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Teen Outreach</td>
<td>Youth development programme</td>
<td>To prevent teenage pregnancy and promote academic achievement among ‘high risk’ young people</td>
<td>School and community</td>
<td>Teachers and adult volunteers</td>
<td>One year</td>
<td>Intervention group</td>
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<td>Young people undertook nearly 50 hours of voluntary service in their local communities, reflected on their experiences in discussion groups, and attended social development classes.</td>
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<tr>
<td>Berrueta-Clement et al, 1984&lt;sup&gt;2&lt;/sup&gt;</td>
<td>The Perry Preschool Program</td>
<td>Early childhood intervention</td>
<td>To improve the intellectual and social development of children from socially disadvantaged families</td>
<td>School and home</td>
<td>Teachers</td>
<td>Two years</td>
<td>Intervention group</td>
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<td>Children received two and a half weeks of preschool education five days a week during term time. Teachers made home visits one afternoon per fortnight.</td>
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<td>Campbell et al, 2002&lt;sup&gt;3&lt;/sup&gt;</td>
<td>The Abecedarian Project</td>
<td>Early childhood intervention</td>
<td>To enhance cognitive skills and “adaptive” behaviour in early childhood among children in “impoverished households”</td>
<td>School and home</td>
<td>Teachers</td>
<td>Eight years</td>
<td>Intervention group</td>
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<td>Children aged 0 to 4 years received full time day care that aimed to develop cognitive and language skills and adaptive behaviour. On entering school, children were assigned a home school resource teacher for three years to encourage parental involvement in learning.</td>
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<td>Children in the control group did not receive any educational intervention but they did receive nutritional supplements for the first 15 months of life.</td>
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<tr>
<td>Hahn et al, 1994&lt;sup&gt;4,6&lt;/sup&gt;</td>
<td>The Quantum Opportunities Program</td>
<td>Youth development programme</td>
<td>To improve academic achievement and social skills among young people from families receiving public assistance</td>
<td>Community</td>
<td>Staff from local Opportunities Industrial Centres (OIC)</td>
<td>Four years</td>
<td>Intervention group</td>
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<td>Young people took part in community improvement activities, educational activities (for example, tutoring), and developmental activities (for example, health education and career and college planning). Financial incentives were provided for participation.</td>
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<td></td>
<td>Children in the control group received no intervention.</td>
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<tr>
<td>Hawkins et al, 1999&lt;sup&gt;9,7&lt;/sup&gt;</td>
<td>The Seattle Social Development Project</td>
<td>Early childhood intervention</td>
<td>To increase school bonding and academic success, reduce physically aggressive behaviour, improve family behaviour management practices, and reduce poor health and other outcomes among children in schools serving high crime areas</td>
<td>School</td>
<td>Teachers</td>
<td>Six years</td>
<td>Intervention group</td>
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<td>Teachers were trained in classroom instruction and management and delivered a cognitive and social skills training curriculum. Parents were offered parent training classes to develop skills in child behaviour management, supporting their children to succeed at school, and reducing their children’s risks for using drugs.</td>
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<td></td>
<td>Children in the control group received no intervention.</td>
</tr>
<tr>
<td>Philliber et al, 2001&lt;sup&gt;8,10&lt;/sup&gt;</td>
<td>The Children’s Aid Society Carrera-Model Program</td>
<td>Youth development programme</td>
<td>To reduce pregnancies amongst socially disadvantaged teenagers</td>
<td>Community</td>
<td>Community workers</td>
<td>Two to three years</td>
<td>Intervention group</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Control group</td>
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<td></td>
<td>Young people were offered academic support; health, sport, and art workshops; and participation in a “job club,” which included work experience and careers advice.</td>
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</table>
who had difficult or unhappy home lives and caring responsibilities (for example, “what on earth is this going to do for me?”). Other reasons related to insufficient or inappropriate support when falling behind with school work or experiencing bullying by teachers and peers (for example, “I got bullied so I just stopped going”). Some young people were frustrated with the inflexibility of “institutional life,” with all its rules and regulations (for example, “You can’t sit with your friends, which I found the best way of learning”). Young parents reported unhappiness, rather than poverty in itself, as the most significant aspect of their childhood experiences that related to becoming a parent, although unhappiness went hand in hand with adversity and material disadvantage in their accounts. Common experiences included family conflict and breakdown, sometimes caused by violence, which could lead to living in care (fig 3). Young fathers reported violent fathers and a lack of suitable role models. Young parents noted how they had to “grow up faster” in order to survive, and also reported a lack of confidence, low self esteem, and high anxiety levels. Some young women saw having a baby at an early age as a way to change their circumstances and ameliorate the effects of adversity. It is important to note, however, that not all the teenage mothers who participated in these studies had grown up unhappy or experienced personal adversity. Regardless of circumstances, some women had wanted to have a baby when they were young and looked forward to still being young when their children were older.

There were differences in the expectations and aspirations of young people who had, or wanted to have, a baby early in life and young people who had or wanted to have a baby later in life. For example, mothers who had children when they were teenagers

### Table 4 | Characteristics of the four high and medium quality qualitative studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Aims</th>
<th>Methods</th>
<th>Study location</th>
<th>Sample size</th>
<th>Gender</th>
<th>Age range</th>
<th>Socioeconomic status</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aral, 2004*†¹¹</td>
<td>To explore the factors present at neighbourhood, family, peer group, and individual levels that influence teenage reproductive behaviour</td>
<td>Cross sectional study using semi-structured interviews with teenage mothers</td>
<td>England (inner London, Greater Manchester, and Northumberland)</td>
<td>15</td>
<td>All female</td>
<td>Not stated</td>
<td>Author presents detail on family background (7 women from two parent families, 5 from one parent families, 3 from the “looked after children” system); marital status (1 married, 14 not married); and housing status (2 women living hostels)</td>
<td></td>
</tr>
<tr>
<td>Burnett, 2003*‡¹²</td>
<td>To examine young women’s experiences of pregnancy and parenthood, and subsequent experiences of professionals and agencies in Suffolk</td>
<td>Cross sectional study using semi-structured interviews and focus groups to collect data</td>
<td>Suffolk, England</td>
<td>17</td>
<td>All female</td>
<td>15-27 years</td>
<td>Not stated</td>
<td>Not stated</td>
</tr>
<tr>
<td>Hooke et al, 2000*†¹³</td>
<td>To explore gender differences in Scottish teenagers’ views about sexual relationships and consequences of teenage pregnancy</td>
<td>Cross sectional study using a self completion questionnaire with ten open ended questions</td>
<td>Ayrshire, Scotland</td>
<td>126</td>
<td>Mixed (50% male, 50% female)</td>
<td>14-15 years</td>
<td>Not stated</td>
<td>Not stated</td>
</tr>
<tr>
<td>Hughes et al, 1999*†¹⁴</td>
<td>To explore the factors that influence young people’s sexual behaviour and their attitudes towards pregnancy and parenthood</td>
<td>Cross sectional survey using discussion groups and semi-structured interviews to collect data</td>
<td>England (London, Birmingham and north-east England)</td>
<td>Not clearly stated (approx. 60)</td>
<td>Mixed (six of the nine discussion groups were female only and three were male only. Six women were interviewed and four men)</td>
<td>15-25 years</td>
<td>Authors describe sample as including teenage mothers and fathers, looked-after young people, the homeless, those excluded from school and young offenders</td>
<td>Not stated</td>
</tr>
<tr>
<td>Wiggins et al, 2005*†¹⁵</td>
<td>To explore the link between teenage parenthood and social exclusion</td>
<td>Part 1 was a prospective study comparing teenage and non-teenage mothers. Part 2 was a cross sectional study using semi-structured interviews with women who were pregnant while teenagers, teenage fathers, and the children of teenage mothers</td>
<td>England, (Derby, Reading, Tunbridge Wells, Stoke, Reading, and inner London)</td>
<td>1262</td>
<td>Mixed (13 teenage fathers interviewed)</td>
<td>16-50 years</td>
<td>Of the teenage mothers, 2/3 lived in social housing, 1/4 were in paid employment, and 1/3 had no educational qualification; 12 of the 13 teenage fathers were “working class”; 17 of the 19 children of teenage parents were “working class”</td>
<td>&quot;White British” approximate 70%; eight other ethnic groups recorded</td>
</tr>
</tbody>
</table>
unhappy childhood and poor material circumstances

Low expectations for the future

Unhappy childhood and poor material circumstances

Table 5 | Comparison of themes arising from studies of young people’s views with interventions assessed in “sound” trials

Themes and potential measures to address them | Coverage in “sound” trials |
--- | --- |
Dislike of school
- Involve young people in decision making about the curriculum; rules and regulations; and design and layout of the school, and other aspects of school culture | None identified |
- Support young people starting at new schools | None identified |
- Equip young people with the skills to form positive relationships with other young people | Allen et al, 1997w7; Hawkins et al, 1999w7 |
- Equip young people with the skills to resolve conflicts | Hawkins et al, 1999w7 |
- Introduce anti-bullying strategies | None identified |
- Introduce training for secondary school teachers to provide emotional support for young people | None identified |
- Introduce learning support interventions | Hahn et al, 1994w6; Philliber et al, 2001w10 |
- Increase parental involvement during secondary school | Hawkins et al, 1999w7 |

Low expectations for the future

Unhappy childhood and poor material circumstances

Do current interventions address the needs and concerns reported by young people?

The themes in our synthesis of qualitative studies suggest areas that should be addressed in preventive interventions, but measures to target these areas have not all been soundly evaluated for their effect on teenage pregnancy rates (table 5).

Youth development programmes and early childhood interventions both go some way to addressing young people’s dislike of school. Two of the three youth development programmes in the controlled trials we reviewed included components designed to promote young people’s academic achievement, such as tutoring and homework assistance, whereas the third aimed to improve young people’s interpersonal skills so they could develop good relationships with their peers and others. One early childhood intervention both taught children conflict resolution skills and trained parents to create a home environment supportive of learning. We did not find any research that had tested the impact on teenage pregnancy rates of interventions designed to change the school culture and environment, such as antibullying strategies, teacher training, or involving young people in making decisions about what happens in the school.

All the youth development programmes aimed to prevent teenage pregnancy by broadening young people’s views with community activities such as sports, music, and arts, which improved their self-esteem and motivation. Young people who wanted children later in life had long term plans and a more positive outlook for the future, and they described how participating in out of school activities such as sports, music, and arts improved their self-esteem and motivation.

<table>
<thead>
<tr>
<th>Youth development programmes</th>
<th>Effect (95% CI)</th>
<th>Weight (%)</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen et al, 1997w1</td>
<td>0.16 (0.02 to 1.24)</td>
<td>7.2</td>
<td>103</td>
</tr>
<tr>
<td>Philliber et al, 2001w10</td>
<td>0.70 (0.27 to 1.80)</td>
<td>33.9</td>
<td>51</td>
</tr>
<tr>
<td>Overall</td>
<td>0.54 (0.23 to 1.28)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Early childhood interventions</th>
<th>Effect (95% CI)</th>
<th>Weight (%)</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawkins et al, 1999w7</td>
<td>0.62 (0.30 to 1.27)</td>
<td>58.9</td>
<td>176</td>
</tr>
<tr>
<td>Overall</td>
<td>0.62 (0.30 to 1.27)</td>
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</tbody>
</table>

Fig 2 | Forest plot showing the effect of youth development programmes and early childhood interventions on pregnancy rates reported by young men

By November 2006, 10.1136/bmj.38405.15784.a2544 on 31 October 2018 by guest. Protected by copyright.
DISCUSSION
Summary of principal findings
This review sought to improve our understanding of the link between social disadvantage and teenage pregnancy by integrating evidence from qualitative studies and quantitative trials.

The evidence from the six controlled trials we looked at showed that early childhood interventions and youth development programmes can significantly lower teenage pregnancy rates. Both types of intervention target the social determinants of early parenthood but are very different in content and timing. Preschool education and support appear to exert a long term positive influence on the risk of teenage pregnancy, as well as on other outcomes associated with social and economic disadvantage such as unemployment and criminal behaviour. Programmes of social support, educational support, and skills training delivered to young people have a much more immediate impact.

Our review of five qualitative studies of young people in the UK indicated that happiness, enjoying school, and positive expectations for the future can all help to delay early parenthood. Young people who have grown up unhappy, in poor material circumstances, do not enjoy school, and are despondent about their future may be more likely to take risks when having sex or to choose to have a baby.

The findings of our review are especially important in the light of evidence that sex education and sexual health services are not on their own effective strategies for encouraging teenagers to defer parenthood; they need to be complemented by early childhood and youth development interventions that tackle social disadvantage. Early childhood interventions and youth development programmes provide enhanced educational and social support in the early years of life and engage young people in developing career aspirations, respectively, thus addressing some of the key themes identified within our qualitative synthesis. However, important gaps exist in the evidence on how effectively current interventions address these themes (table 5). Structural and systemic issues such as housing, employment opportunities, community networks, bullying, and domestic violence were all important issues in young people’s accounts, but these factors have yet to be addressed in appropriate interventions and evaluated as wider determinants of teenage pregnancy.

Comparison with other studies
Our review adds to a growing body of research identifying factors that may explain the association between social disadvantage and teenage pregnancy. Dislike of school, an unhappy childhood, and a lack of opportunities for jobs and education have all emerged as explanatory factors in large scale national and international
What is already known on this topic

Evidence suggests that sex education and better sexual health services do not reduce teenage pregnancy rates. A number of controlled trials have tested the effects of interventions that target the social disadvantage associated with early pregnancy and parenthood, and a number of qualitative studies have considered young people’s views of the factors associated with teenage pregnancy. No systematic review has brought these quantitative trials and qualitative studies together to determine intervention effectiveness and appropriateness.

What this study adds

Early childhood interventions and youth development programmes that combine individual and structural level measures to tackle social disadvantage can lower teenage pregnancy rates. Such interventions are likely to be appropriate for children and young people in the UK because they improve enjoyment of school, raise expectations and ambitions for the future, and ameliorate the effect of an unhappy childhood in poor material circumstances. A policy move to invest in interventions that target social disadvantage should complement rather than replace high quality sex education and contraceptive services.

WHAT IS ALREADY KNOWN ON THIS TOPIC

A number of controlled trials have tested the effects of interventions that target the social disadvantage associated with early pregnancy and parenthood, and a number of qualitative studies have considered young people’s views of the factors associated with teenage pregnancy. No systematic review has brought these quantitative trials and qualitative studies together to determine intervention effectiveness and appropriateness.

WHAT THIS STUDY ADDS

Early childhood interventions and youth development programmes that combine individual and structural level measures to tackle social disadvantage can lower teenage pregnancy rates. Such interventions are likely to be appropriate for children and young people in the UK because they improve enjoyment of school, raise expectations and ambitions for the future, and ameliorate the effect of an unhappy childhood in poor material circumstances. A policy move to invest in interventions that target social disadvantage should complement rather than replace high quality sex education and contraceptive services.

epidemiological analyses. Dislike of school appears to have an independent effect on the risk of teenage pregnancy. Our analysis of qualitative research provides additional insight into how factors that increase the risk of teenage pregnancy may operate. For example, a dislike of school was frequently the result of bullying, frustration with rules and regulations, lack of curriculum relevance, boredom, and inadequate support.

As well as developing and testing interventions to modify these antecedents, future research on teenage pregnancy and social disadvantage needs to consider strategies that counter the stigmatisation and discrimination faced by young parents. Some of the social exclusion experienced by young parents is the result of negative societal reaction. However, there is evidence to suggest that teenage parenting can under certain circumstances be a route to social inclusion rather than exclusion.

Like many other systematic reviews in health promotion and public health, we found few trials conducted in the UK. This raises questions about the generalisability of the trial evidence. Our inclusion of qualitative evidence permitted us to examine the appropriateness of interventions evaluated in US trials from the perspective of young people in the UK. The appropriateness of interventions is an important aspect of generalisability to consider. Our inclusion of qualitative evidence does not, however, replace the need for further trials in the UK and elsewhere to address the impact of interventions designed to ameliorate the wider determinants of teenage pregnancy.

A recent study carried out in England evaluated the effects of the Young People’s Development Programme—an intensive, multicomponent youth development intervention based on the Children’s Aid Society Carrera Model Program. In contrast to the findings of this review, the quasi-experimental study found that young women in the intervention group were more likely to report pregnancy than those in the comparison group. This finding may be the result of the potentially stigmatising effect of targeting and labelling young people as “high risk” or of introducing participants to other “high risk” young people in alternative educational settings. In comparison with the Young People’s Development Programme, the youth development programmes evaluated by the controlled trials in our review used after school programmes or interventions delivered in community settings rather than the approach of keeping young people out of mainstream schools and working with them in alternative educational settings. This difference in approach may explain the difference in the findings of the two studies and highlights the need to evaluate a revised youth development programme in the UK.

Strengths and limitations of the study

The strengths of our review include the comprehensiveness of our searches, the exclusion of methodologically weak studies, the rigorous synthesis methods used, and the inclusion of qualitative research alongside controlled trials to establish not only “what works” but also appropriate and promising intervention strategies on the basis of young people’s views on the factors associated with teenage pregnancy. Including only studies that evaluated interventions relative to control conditions over the same period of time avoids missing temporal differences between groups. Such changes include the relaxing of abortion laws and the increasing acceptability of abortion over time, which may affect self reported pregnancy rates.

The small numbers of studies we found are a limitation of the available body of research, as is the dominance of controlled trials conducted in the US (although this is a common feature of many health promotion and public health reviews). Our search strategies would have under-represented non-English language studies. As with any systematic review, we cannot be certain that we identified all relevant studies; in particular we may not have identified all unpublished studies, which are more likely to report negative findings than are published studies. We are only aware of one relevant study published since the searches for this review were carried out: the evaluation of the Young People’s Development Programme. Whether this study would meet the quality criteria for our review is unclear, but it should be considered in any update.

Conclusion and policy implications

This review provides a small but reliable evidence base that early childhood interventions and youth development programmes are effective and appropriate strategies for reducing unintended teenage pregnancy rates. Our findings on the effects of early childhood interventions highlight the importance of investing in early care and support in order to reduce the socioeconomic disadvantage associated with teenage pregnancy later in life. Both the early childhood interventions and the youth development programmes combined structural
level and individual levels components, which is in line with many current recommendations in health promotion and public health.14,51 A policy move to invest in youth programmes should complement rather than replace high quality sex education and contraceptive services, and should aim to improve enjoyment of school, raise expectations and ambitions for the future, and provide young people with relevant social support and skills.

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Competing interests: None declared.


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