

Intervention Now to Eliminate Repeat Unintended Pregnancy in Teenagers (INTERUPT): a systematic review of intervention effectiveness and cost-effectiveness, and qualitative and realist synthesis of implementation factors and user engagement

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Scientific summary

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Scientific summary

Background

The UK has the fourth highest rate of teenage pregnancy in Western Europe, and one-fifth of these are estimated to be repeat pregnancies. Unintended conceptions can cause emotional, psychological and educational harm to young girls, often with enduring implications for their life opportunities. Children of teenage mothers have increased mortality in their first year and an increased risk of poverty, educational under achievement and unemployment in later life, with associated societal costs.

Objectives

Our aims were to identify:

- who is at the greatest risk of repeat unintended pregnancies
- which interventions are effective and cost-effective, and how these work, for whom and in what setting
- what the barriers to and facilitators of intervention uptake are.

Methods

We conducted a streamed, mixed-methods systematic review to find and evaluate interventions designed to reduce repeat unintended adolescent pregnancies and to determine what works, for whom and in what context. Electronic database searches were guided by an advisory group of stakeholders.

To address the topic's inherent complexities, we used a structured, iterative approach combining methods tailored to each stream of evidence. Quantitative data were synthesised with reference to Cochrane guidelines for evaluating evidence on public health interventions. Qualitative evidence primarily addressing the facilitators of and barriers to the uptake of interventions, experience and acceptability of interventions was synthesised thematically. We applied the principles of realist synthesis to uncover theories and mechanisms underpinning interventions. We sought feedback from both health-care professionals, involved in relevant service delivery in Wales, and a group of young mothers, with the assistance of two frontline organisations, Barnardo's Cymru (Cardiff, UK) and Flying Start (Swansea, UK). After this, an overarching narrative summary of the different streams of evidence was produced.

Inclusion and exclusion criteria

We used the patient intervention comparison outcome approach to include peer-reviewed studies published after 1995, from any country or in any language, which focused on interventions for, views on and risk factors for repeat adolescent pregnancy. We limited our searches on the grey literature to the UK to enhance the direct applicability of the results to the NHS and UK public health bodies. We did not exclude studies on the basis of quality, but incorporated judgements about study quality when interpreting the evidence.

Interventions

We included studies of any intervention designed to reduce repeat unintended pregnancies (also referred to as 'birth-spacing' or 'pregnancy-spacing') in young women, delivered in any educational, health-care or community setting. Interventions could have single or multiple components, and could be delivered to individuals or communities. We also included studies designed to identify risk factors or subgroups at increased risk of repeat unintended pregnancy when there was no actual intervention being tested.

We included studies that identified barriers to and facilitators of the implementation and uptake of interventions, and explored the views of intervention recipients, providers and health-care professionals, particularly with regard to whether or not the intervention was implemented and worked in the way intended. We looked for studies that would help us to identify programme theories and logic, and we sought and developed candidate theories to explain why some young women have more than one unplanned pregnancy and which could help to explain the relative success or failure of particular interventions.

Main outcome measures

We report on the primary and secondary outcomes listed below. These outcomes were addressed using a range of evidence types and analytical techniques.

Primary outcomes

- Effectiveness of interventions (unintended teenage pregnancy).
- Acceptability of intervention (the proportion of participants that reported that the intervention was acceptable or, in the absence of this, the proportion of participants who were willing to be recruited into the study).
- Uptake of the interventions (the proportion of participants who were recruited and received the intervention compared with those recruited).

Secondary outcomes

- Reported changes in knowledge and attitudes about the risk of unintended pregnancies.
- The initiation of sexual intercourse.
- The use of birth control methods.
- Abortion.
- Childbirth.
- Morbidity related to pregnancy, abortion or childbirth.
- Mortality related to pregnancy, abortion or childbirth.
- Sexually transmitted infections (including human immunodeficiency virus).
- Risky behaviours.
- Abuse.
- Validated quality of life indices.

The other phenomena of interest for the qualitative synthesis and realist review were the views and experiences of young women, families and professionals, and the identification of barriers to and facilitators of interventions with regard to (1) acceptability, (2) uptake and (3) feasibility of implementation.

Assessing the quality of evidence, filtering the material and reporting the evidence

We used a range of techniques to ensure that we identified and included all the appropriate material and made sound judgements with regard to its quality. Completeness, accuracy, relevance and timeliness (CART) criteria were modified and used to assess the completeness, accuracy, relevance and timeliness of the studies to be included. The mixed methods appraisal tool (MMAT) was used to appraise the quality of the studies, the Cochrane risk of bias tool was used to analyse the quality of the randomised trials and the Drummond checklist was used to assess the quality of the economic evidence. Grading of Recommendations Assessment, Development and Evaluation was used to evaluate the certainty of the findings from the randomised controlled trials (RCTs), the certainty of the qualitative evidence approach was used to assess the qualitative studies and criteria adapted from those defined by Pawson were used for the realist synthesis (Pawson R. *Evidence-Based Policy: A Realist Perspective*. London: Sage; 2006). We used Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to guide our reporting and the place, race, occupation, gender, religion, education, socioeconomic status and social status (PROGRESS) framework to describe individual study details.

Synthesis

The studies considered in this review were diverse and data synthesis was complex. The choice of synthesis method used depended on the questions being addressed and the type of data included. We designed a model for incorporating six types of syntheses, which tackles different evidence streams. Meta-analysis and narrative summary explored the question 'was the intervention effective and was it cost-effective?', metaregression was deployed to identify risk factors and effect modifiers, thematic synthesis and narrative summaries tackled questions regarding implementation, framework synthesis was used to consider the acceptability of interventions and narrative summaries were made for other evidence streams that contained interesting and relevant data not evaluated elsewhere. Unusually for this type of review, we also undertook a realist synthesis which explored key questions regarding whether or not interventions worked as planned, what worked for whom and in what contexts, and whether or not there were barriers to and facilitators of intervention uptake.

We combined all the evidence and syntheses streams in an overarching narrative synthesis and juxtaposed the programme theories of interventions from the trials evidence against the qualitative synthesis, risk factors, realist synthesis, views of stakeholders and service users.

Results

After identifying 8664 documents by initial searching, 413 by citation searching and 403 new documents by repeating the searches towards the end of our study, we filtered these down to 10 RCTs (one with an economic evaluation), four quasi-RCTs, 10 qualitative studies and 53 other quantitative studies worthy of inclusion in the analysis. We were assisted in this process by input from our stakeholder group who helped us develop the CART criteria in a mapping exercise of 118 studies selected after the initial search results had been assessed. Most of the studies included in the mapping exercise were from the USA, with two other clusters, in the UK and Brazil, being observed. No RCTs from the UK were identified.

Using Effective Practice and Organisation of Care criteria, we refined the categorisation of the studies to identify 14 RCTs published between 1996 and 2012, one of which was a cluster randomised trial, and two non-randomised trials for potential inclusion in the meta-analysis. One of the 'trials' was a meta-analysis of 12 smaller trials and quasi-RCTs and had a large risk of bias; therefore, we did not include it in the primary analysis. We analysed 12 RCTs in the principal analysis, but have included the results when the other four studies were included as a sensitivity analysis.

Two intervention types emerged from the trials: emergency contraception (considered by one study) and psychosocial, complex interventions (explored by 11 studies). Of the 11 psychosocial, complex interventions, six were delivered as home-based interventions, two were primarily group-based interventions and one was a telephone-based intervention. We found no evidence of effectiveness of interventions related to condom use or contraceptive use, or the rate of unprotected sex or birth control in any of the studies. There were so few studies reporting any of these outcomes that meta-analysis was either pointless or unhelpful. Our primary outcome was repeat conception rate. All six trials of home-based psychosocial interventions reported this outcome and, when combined, the event rate was 132 of 308 (43%) for the intervention arm versus 140 of 289 (48%) for the control arm. This gives a non-significant risk ratio (RR) of 0.92 (95% CI 0.78 to 1.08) in favour of the intervention. None of the individual studies showed a significant effect, and this was borne out by the meta-analysis. However, when four larger studies were included in the sensitivity analysis there was a slight shift towards suggesting that the intervention was indeed effective: event rates of 288 of 1077 (27%) in the intervention arm and 297 of 1004 (30%) in the control arm, giving a RR of 0.88 (95% CI 0.78 to 1.00). The differing event rates between these two analyses reflect the differing populations in the two larger studies examined in the sensitivity analysis.

For the trials included in the main analysis, four studies reported subsequent birth rates, but none of these studies reported significant effects. However, once subjected to meta-analyses the combined effect became significant: 29 of 237 intervention arm events (12%) compared with 46 of 224 (21%) events in the control arm, with a RR of 0.6 (95% CI 0.39 to 0.93).

Only one study identified provided data on cost. Overall, the mean intervention cost per adolescent was US\$2064, with unadjusted and adjusted incremental cost-effectiveness ratios (ICERs) per prevented birth of US\$21,895 and US\$17,388, respectively. The authors concluded that the costs and ICERs for the complex psychosocial programme computer-assisted motivational interviewing compare favourably with other 'effective' programmes aimed at pregnancy prevention; however, the evidence base was limited.

Any comparative studies that provided epidemiological information suitable for metaregression were included in the risk factor analysis. Despite using all available evidence types, there were only seven risk factors identified by enough studies to analyse, and all of the assessments of risk produced very wide confidence intervals, with the evidence of risks being weak and unreliable. Qualitative evidence identified risk factors and issues that were not addressed by the programme theories of included interventions.

The majority of the qualitative studies were not intervention focused, with only one study carried out in the context of a school-based programme. Most studies were conducted in the USA; however, there were two high-quality UK studies. The qualitative synthesis showed that many repeat conceptions occurred in the context of poverty, low expectations and aspirations, and negligible opportunities.

The realist synthesis suggested that context, motivation, planning for the future, and letting young women take control with connectedness and tailoring provide a conceptual framework to help guide future research. It elaborated on the pressures and influences, from various sources, which face young adults and shape their views, experiences, and ability to negotiate relationships and motherhood. These factors motivate them either to take control and consistently protect against pregnancy or to take a more relaxed approach to these issues. It also suggested that young women need to be engaged in the issue of pregnancy prevention, they need to know that they are being listened to and that the choice to have safe sex is theirs, thereby giving them some perception that they have control of their bodies, decisions and lives.

Service user engagement supported many of these findings and emphasised that repeat conceptions were often intended to replace loss or to please a partner.

Discussion

Despite extensive searching across different databases, the various streams of our review have yielded inconclusive and inconsistent answers to our research questions. With regard to the risk of repeat unintended pregnancy, we found no evidence from our metaregressions of an association with any of the following factors or variables: age, education, history of abuse, smoking, living with the father of the children, or the use of oral or long-acting reversible contraception. However, qualitative evidence suggested that risk factors and reasons for repeat unintended pregnancy were diverse and included:

- contextual factors, such as lack of family or peer support, and a chaotic lifestyle
- motivational factors, such as lack of personal goals and aspirations
- emotional factors, particularly to fill an emotional void after an abortion or adoption
- practical factors, such as the desire to complete one's family whilst still young.

Qualitative evidence also helped to explain the barriers to the uptake of interventions. Such barriers included poor knowledge, lack of information and misconceptions about contraceptive methods, poor access to services and a lack of continuity of care.

With regard to interventions for reducing repeat unintended pregnancy, most RCTs were of psychosocial programmes conducted by home visits, community interventions or over the telephone. Meta-analyses found no statistically significant reduction in repeat pregnancy, although there was a reduction in live births. There was also a reduction in the number of young mothers dropping out of school; however, this result was not statistically significant. The realist synthesis highlighted context, motivation, planning for the future, taking control, situating the intervention within a broad context, connectedness and tailoring with regard to providing a conceptual framework for future research. Young women need to be engaged in the issue of pregnancy prevention, they need to know that they are being listened to and that the choice to have safe sex is theirs, thereby giving them some perception that they have control of their bodies, decisions and lives.

Conclusions

We have found no conclusive evidence that any of the interventions considered to reduce repeat teenage pregnancy were effective. However, while 'the absence of evidence is not evidence of absence', this study does provide evidence of the absence of evidence. We discovered very few well-designed studies capable of providing good evidence of effect. There was some weak quantitative evidence indicating that home delivered, multicomponent, complex psychosocial interventions may be effective in reducing teenage conceptions and subsequent births, and may help teenage mothers to remain in education. This evidence was strengthened and supported by the qualitative evidence and realist synthesis.

More rigorously conducted and better-reported studies are needed, and the other goals of adolescent parenting programmes, beyond a simple reduction in the incidence of pregnancy, need to be subjected to rigorous quantitative scrutiny.

Study registration

This study is registered as PROSPERO CRD42012003168. Cochrane registration number: i=fertility/0068.

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