A review of prenatal home-visiting effectiveness for improving birth outcomes  
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CRD summary
This review found that prenatal home visiting appeared to improve prenatal care utilisation, but found no clear evidence of improved birth weight or pre-term birth rates. In view of the poor quality of much of the evidence, variation between the studies and lack of reliable effect estimates, the authors’ conclusions about the benefits of the intervention require cautious interpretation.

Authors' objectives
To assess the effectiveness of prenatal home visiting for improving birth outcomes.

Searching
MEDLINE, CINAHL, PsycINFO and Social Work Abstracts were searched for studies published from 1985 to 2009. Search terms were reported. Relevant electronic mailing lists (listservs) were used to solicit unpublished studies. Reference lists, citing articles of the studies retrieved and the reference lists of published meta-analyses were checked. The search was limited to articles in English.

Study selection
Comparative quantitative studies of prenatal home visiting (a non-medical intervention promoting utilisation of health or social services) for pregnant women at high medical risk or social risk of adverse birth outcomes were eligible for inclusion. Studies were required to report prenatal care utilisation, pre-term birth (as defined in the primary study), gestational age at birth, and/or birth weight. The intervention could be stand-alone or part of a comprehensive prenatal care programme. Studies were excluded if they did not describe components of the intervention, or reported only prenatal medical care (such as foetal monitoring) or costs.

The mean age of women in the included studies ranged from 17 to 34 years. Most studies enrolled convenience samples or reviewed population or hospital data. None of the studies were limited to women in the first trimester of pregnancy. Few studies reported enrolment prior to 26 weeks' gestation; some women were enrolled as late as 32 weeks' gestation. Interventions included between two and six different components, most commonly co-ordination, teaching and support. For most studies, it was unclear whether there was a standardised intervention protocol. Few studies reported the number and duration (the dose) of prenatal home visits per woman. Prenatal care utilisation was measured with a scale for adequacy of care use or by number of visits. Most studies defined preterm birth as up to 36 weeks' gestation.

The authors did not state how the papers were selected for the review.

Assessment of study quality
Study quality was assessed the Downs and Black rating scale to assess quality of reporting (12 items), external validity (four items), bias affecting internal validity (seven items), confounding affecting internal validity (six items), and statistical power. The maximum score was 31 points.

The authors did not state how many reviewers conducted the assessment.

Data extraction
As many studies did not report sufficient statistical data to allow calculation of effect sizes, data were extracted on the direction of findings for each outcome in each study, regardless of statistical significance.

Two reviewers independently extracted the data, with disagreements resolved by consensus or by discussion with a third reviewer.

Methods of synthesis
Study findings were combined using a vote-counting method and sign tests to indicate whether the frequency of findings in favour of home visiting exceeded chance for each outcome. P values were calculated for sign tests.
Results of the review
Twenty eight studies were included in the review (n=270,822 women, range 109 to 74,665) including 13 randomised controlled trials (RCTs), seven retrospective and two prospective cohort studies, two case-control studies, and four studies using other observational designs. Quality scores ranged from 10 to 28 points (mean 18.6); only 12 studies scored 20 or more points. The most common weaknesses were lack of blinding, failure to adjust for intervention dose, and lack of a theory to guide the intervention.

Prenatal care utilisation (two RCTs, nine observational studies): The intervention was associated with significant benefit in five studies in total, but not in the two RCTs. Nine of 12 comparisons favoured the intervention (sign test p=0.04). Outcomes were the same or worse in the other studies.

Birth weight (12 RCTs, 12 observational studies): The intervention was associated with significant benefit in three RCTs and seven studies. Twelve of 24 comparisons favoured the intervention (sign test p=0.50). Outcomes were the same or worse in the other studies.

Gestational age/pre-term birth (10 RCTs, five observational studies): The intervention was associated with significant benefit in one RCT and four studies in total. Eight of 16 comparisons favoured the intervention (sign test p=0.50). Outcomes were the same or worse in the other studies.

Authors' conclusions
Prenatal home visiting appeared to improve prenatal care utilisation, but there was no clear evidence of improvement in birth weight or pre-term birth rate.

CRD commentary
The objectives and inclusion criteria of the review were clear. Relevant sources were searched for studies, although the language restriction to English meant that some studies may have been missed. The potential for publication bias was not discussed. Steps were taken to minimise the risk of reviewer bias and error by having more than one reviewer independently extract the data, but it was unclear whether this also applied to study selection and quality assessment.

As the authors noted, the vote-counting method of study synthesis did not take into account sample sizes (which differed vastly) or the size of effect estimates. The authors also acknowledged that most studies were of suboptimal quality and did not report statistical findings, adjust for intervention dose or investigate which components of the intervention were effective. This made it difficult to determine the reliability of review findings. This applied particularly to care utilisation, where the authors' conclusions were inconsistent with the evidence of the available RCTs. There were very marked differences between the studies (such as design and interventions).

In view of the poor quality of much of the evidence, heterogeneity between the studies and lack of reliable effect estimates, the authors’ conclusions about the benefits of the intervention require cautious interpretation.

Implications of the review for practice and research
Practice: The authors stated that resources should be directed to programmes clearly reporting the number and duration (dose) of prenatal home visits. They recommended early enrolment (in the first trimester) to maximise the dose.

Research: The authors stated that a standardised approach should be developed to measure prenatal home visiting dose and that high quality studies should investigate specific components of the intervention and the effects of dose. They noted that documentation of outcomes would help to clarify the benefits of the intervention and the means by which it worked.

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