The effectiveness of public health strategies to reduce or prevent the incidence of low birth weight in infants born to adolescents: a systematic review

Brunton G, Thomas H

Authors' objectives
To determine the effectiveness of public health, health promotion, and primary care strategies to reduce or prevent the incidence of low birth weight in infants born to adolescents up to 19 years of age.

Searching
The following electronic databases were searched back to inception: the Cochrane Library, MEDLINE, EMBASE, CINAHL, PsycINFO, ERIC, Sociological Abstracts, Dissertation Abstracts, and EPHPract Database (a local database held by Hamilton-Wentworth Public Health Research, Education and Development). The search strategies, including search terms, were reported in the review. The following were handsearched: American Journal of Public Health, Canadian Journal of Public Health, Health Promotion International, Journal of Obstetric, Gynaecologic and Neonatal Nursing (JOGN), and the bibliographies of all studies rated relevant. Journals were searched from January 1995 to May 2000, while bibliographies were searched back to January 1995. In addition, other sources such as conference proceedings were searched, and key informants were contacted for published and unpublished studies. The search was extended to French language databases.

Study selection
Study designs of evaluations included in the review
Controlled studies that were prospective in design (where pre-test data collection and intervention preceded outcome measurement) were eligible for inclusion.

Specific interventions included in the review
Studies of interventions that were designed for preventing or reducing low birth weight in infants were eligible for inclusion. The interventions had to be applicable to public health practice in Canada (i.e. consistent with Ontario's Mandatory Health Programs and Services Guidelines) and be able to be implemented, facilitated or promoted by staff in local public health units in Canada.

Of the included studies, some employed more than one intervention. The locations used were health units, the community, hospitals, health maintenance organisations and schools. The interventions were provided in clinics or a clinic setting, at home or by telephone. The intervention providers included nurses, public health nurses, health educators, nutritionists, social workers, health care aides, registrars, peer educators, and lay or paraprofessional home visitors. The intervention strategies used included health information, support strategies, encouragement to attend prenatal medical visits, standard medical care and referrals. The interventions were targeted at individuals, families and groups.

Participants included in the review
Studies that studied adolescents exclusively or provided analysis by age group were eligible for inclusion. The age of the participants in the included studies ranged from 13 to 23 years.

Outcomes assessed in the review
Studies that used birth weight as an outcome were eligible for inclusion. The outcome measures employed by the included studies were rate of low birth weight, mean birth weight, rate of pre-term delivery, rate of infants born small for gestational age, mean difference of birth weight, birth weight below 25th percentile, birth weight above 75th percentile, and mean gestational age.

How were decisions on the relevance of primary studies made?
Two independent reviewers assessed the studies for inclusion. Any disagreements were resolved by discussion.
Assessment of study quality
The included studies were assessed for methodological quality using previously developed and tested criteria (rated as strong, moderate or weak): selection bias, study design, control of confounders, blinding, data collection methods, and description of withdrawals and drop-outs. The studies were rated as strong (at least four criteria were rated strong, with no weak ratings), moderate (one to three criteria were rated strong and one criterion was rated weak), or weak (at least two criteria were rated weak). Two independent reviewers assessed the quality of the included studies. Any disagreements were resolved by discussion.

Data extraction
Two independent reviewers extracted detailed data relating to study design, sample and intervention from studies determined to be of strong or moderate quality. Any disagreements were resolved by discussion.

Methods of synthesis
How were the studies combined?
A qualitative narrative synthesis was undertaken.

How were differences between studies investigated?
Differences between the studies were discussed in the text and in tables.

Results of the review
Fifteen studies met the inclusion criteria. Details were provided for 2 studies rated as weak quality. The remaining 13 studies (n=5,941) consisted of 3 randomised controlled trials, 3 cohort studies, 4 matched cohort studies, 1 cohort analytic study and 1 matched case-control study.

Of the 15 studies meeting the inclusion criteria, 2 were rated as weak, 9 as moderate and 4 as strong. The studies of weak quality were not data extracted or examined further.

Five (38.5%) of the 13 studies examined further reported a significant improvement in birth weight, or a decrease in the incidence of pre-term delivery or intra-uterine growth restriction. All 5 studies provided support and health education as intervention strategies, and were home- or clinic-based. Intervention delivery was provided one-to-one or in a class series format. The remaining 8 studies found positive, but not statistically-significant differences in birth weight between the groups.

Authors’ conclusions
Some home- and clinic-based interventions that focus on health education and support strategies directed to pregnant adolescents can have significant effects on reducing low birth weight in infants. More rigorous research, including studies that benefit from the adolescents’ input, is needed to determine the appropriate philosophy underlying effective interventions, as well as to evaluate adolescent-specific interventions.

CRD commentary
The aim of the review was clearly stated and was well-supported by predefined inclusion criteria. However, criteria relating to age were unclear: although the study objective indicated that adolescents up to 19 years of age were eligible for inclusion, the specific inclusion criteria defined only adolescents and did not provide an age limit. In actual fact, individuals aged up to 23 years were included in this review. The literature search was comprehensive and used a number of electronic databases, supplemented by additional sources. The search was, however, limited to English and French language articles only. It is likely, therefore, that relevant studies may have been missed. The validity of the included studies was adequately assessed and relevant study details were tabulated clearly. The data were appropriately combined in a narrative. Full details relating to the review process, such as how the inclusion assessment, validity assessment and data extraction processes were performed, were reported. The authors’ conclusions follow on from the results.
Implications of the review for practice and research

Practice: The authors state that public health interventions that employ a combination of home visiting and clinic services can have a positive effect in reducing the incidence of low birth weight in infants born to adolescents. Public health policy makers should continue to make pregnancy counselling, with early identification and referral, available through existing strategies such as school health services and community birth control clinics.

Research: The authors state that new research should focus on a well-designed prospective cohort or a randomised controlled trial, and should specifically target adolescents in Ontario. Such a study should be developed and implemented with adolescent involvement, incorporate adequate sample size, and use multiple strategies in home and clinic settings. Studies are also needed to determine whether it is a combination of specific intervention strategies or specific strategies by themselves that contribute to positive outcomes.

Funding

Ministry of Health and Long Term Care, Public Health Branch, PHRED Program.

Bibliographic details

Brunton G, Thomas H. The effectiveness of public health strategies to reduce or prevent the incidence of low birth weight in infants born to adolescents: a systematic review. Hamilton, ON, Canada: City of Hamilton, Social and Public Health Services Division. Effective Public Health Practice Project. 2001

Original Paper URL

http://old.hamilton.ca/phcs/ephpp/Research/Full-Reviews/Low-Birth-Weight-Review.pdf

Indexing Status

Subject indexing assigned by CRD

MeSH

Adolescent; Body Weight; Female; Infant, Low Birth Weight; Infant, Newborn; Maternal Age; Pregnancy; Pregnancy in Adolescence; Prenatal Care

AccessionNumber

12002008005

Date bibliographic record published

31/10/2003

Date abstract record published

31/10/2003

Record Status

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.