Pacifiers and breastfeeding: a systematic review
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CRD summary
The authors concluded that the strongest evidence at the time of the review showed infant pacifier use was not detrimental to breastfeeding outcomes. There were some limitations to this review, but overall it was well-conducted and the authors' conclusions are likely to be reliable.

Authors' objectives
To examine the relationship between the use of infant pacifiers and breastfeeding.

Searching
MEDLINE, CINAHL, EMBASE, The Cochrane Library, POPLINE and reference lists of identified studies were searched for studies published in any language between 1950 and August 2006. Search terms were reported. Studies were included only if they were published in English.

Study selection
Studies with a clearly defined control group that reported an association between pacifier use and initiation or duration of breastfeeding in healthy term or preterm infants were eligible for inclusion. Cohort studies/controlled trials had to have at least 70% follow-up. Surveys had to have at least a 50% participation rate. Studies of infants with congenital anomalies were excluded.

Randomised controlled trials (RCTs), cohort studies and cross-sectional studies were included. Studies were set in 12 countries. Participants came from a range of demographic and socio-economic backgrounds. Studies evaluated pacifier use at different times (for example, in hospital and from two weeks to six months of age). Some studies classed pacifier use as any use of a pacifier and others differentiated between frequent and occasional use. Studies used different definitions for breastfeeding outcomes and measured outcomes using different scales (outcomes included overall duration of breastfeeding and breastfeeding at specified times from hospital discharge until 12 months of age; breastfeeding could be exclusive, predominant or any).

One reviewer selected studies.

Assessment of study quality
Two reviewers independently assessed validity in terms of: accounting for all patients at study completion; study design; 90% or more follow-up or response rate greater than 80%; relationship between pacifier use and breastfeeding was the main outcome; relationship examined with respect to multiple variables; exposure/outcomes assessed similarly for both treatment groups; and methods used to select sample. Maximum possible quality scores were 9 points for randomised controlled trials (RCTs) and cohort studies and 7 points for cross-sectional studies. Discrepancies between reviewers were resolved by consensus with the help of a third reviewer.

Data extraction
Where possible, for each RCT, univariate and multivariate odds ratios and relative risks or hazard ratios were presented with 95% confidence intervals (CI). Two reviewers independently extracted data. Discrepancies between reviewers were resolved by consensus with the help of a third reviewer.

Methods of synthesis
Differences between studies precluded use of planned meta-analysis. The studies were grouped by design and combined in a narrative synthesis. The review focused on results from the RCTs.

Results of the review
Four RCTs (n=1,886), 20 cohort studies and five cross-sectional studies were included. The size of treatment groups in
RCTs ranged from 140 to 354.

The RCTs scored 5 to 8 out of 9 for validity; details of criteria not met by individual studies were reported. RCTs evaluated different types of pacifier use: use during tube feeding or for soothing versus no pacifier; use during the neonatal period versus use after four weeks postpartum; an education programme that emphasised avoidance of pacifier use versus use of pacifiers; and a baby-friendly hospital environment in which pacifiers were avoided versus unrestricted pacifier use. Three studies were in infants born at 36 weeks or later; one study was in preterm infants (23 to 33 weeks).

None of the RCTs reported a statistically significant difference in breastfeeding outcomes associated with pacifier interventions.

Seventeen of the 25 observational studies reported shortened duration or exclusivity of breastfeeding associated with pacifier use for all outcomes examined; eight studies reported no significant association for either all or some breastfeeding outcomes. Most studies controlled for multiple variables.

**Authors’ conclusions**
The strongest evidence showed that infant pacifier use was not detrimental to breastfeeding outcomes.

**CRD commentary**
The review question was clearly stated and inclusion criteria were appropriately defined. Several relevant sources were searched, but no attempts were made to minimise publication or language bias; the potential for language bias was acknowledged by the authors. Methods were used to minimise reviewer errors and bias in the assessment of validity and extraction of data, but similar methods were not used for study selection (which was performed by one reviewer). Adequate information was provided about the RCTs. Study validity was assessed and results were reported for RCTs. In view of the diversity among studies, a narrative synthesis with a focus on higher-quality evidence from the RCTs was appropriate. There were some limitations to this review, but overall the review was well-conducted and the authors’ conclusions are likely to be reliable.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that further research was required to confirm review findings and to investigate the relationship between pacifier use, breastfeeding and sudden infant death syndrome. There was a need to understand the social and cultural factors that influenced pacifier use.

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