The relationship between birth with a health professional and maternal mortality in observational studies: a review of the literature

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CRD summary
The authors concluded that the relationship between maternal mortality with a health professional may not be linear and that a threshold of uptake may need to be reached before maternal mortality starts to fall. The authors’ conclusion is based on the results of one study of unknown quality and may not be reliable.

Authors' objectives
To examine the nature of the association between maternal mortality and birth with a health professional in observational studies. (Only the review of individual studies is reported in this abstract).

Searching
PubMed was searched between 1963 and 2009 for articles in English. Search terms were reported. Reference lists of relevant articles were searched.

Study selection
Studies that examined the association between maternal mortality and births with a health professional were eligible for inclusion. Studies were included if they reported data on maternal mortality rate and relative risks of mortality that compared births with or without a health professional. Studies that reported only maternal deaths and not births, and studies with more than 25% missing data were excluded.

The included studies considered the maternal mortality rate in women in Pakistan, India, Indonesia, Senegal, Mali and USA. The definition of birth with a health professional was described as: delivery in a hospital or health centre; delivery with a doctor, nurse, midwife or health visitor; or not being a member of the Faith Assembly. The outcome was maternal mortality reported either as one of two WHO International Classification of Diseases: ICD-10, ICD-9 or pregnancy-related deaths occurring up to one year after pregnancy termination.

The authors did not state how many reviewers performed study selection.

Assessment of study quality
The authors did not state if quality assessment was undertaken.

Data extraction
Data were extracted on maternal mortality rate, number of births and deaths, relative risk of mortality and whether or not birth took place with a health professional.

The authors stated that data was extracted by one reviewer and checked by a second.

Methods of synthesis
A narrative review combined studies that provided risk of dying with or without a health professional. If relative risks were not presented, crude odds ratios (OR) and 95% confidence intervals (CIs) were calculated. Maternal mortality rate and Poisson exact 95% CIs were calculated, where possible, if not provided.

Results of the review
Nine studies were included in the review: three prospective cohort studies; four case-control studies; one cross-sectional study; and one study that used medical and vital records.

Two studies found lower odds of mortality in women who gave birth with a health professional compared to women
who gave birth without a health professional (OR ranged from 0.011 to 0.45).

Four studies found increased odds of maternal mortality ratio in women who gave birth with a health professional compared to women who gave birth without a health professional (OR ranged from 1.85 to 7.83). Four studies found no difference.

**Authors' conclusions**

Data suggested that the relationship between birth with a health professional and maternal mortality may not be linear and that a threshold of uptake may be needed before maternal mortality started to fall. None of the study designs were optimal for evaluation of the impact on maternal mortality of births with a health professional.

**CRD commentary**

Inclusion criteria for the review were broadly defined. One relevant database was searched. No unpublished studies were searched for and publication bias was not assessed, which may have introduced bias into the review. There was potential for language bias as only English-language articles were included. The authors did not state whether study selection was conducted in duplicate, which could have introduced selection bias into the review. Two authors performed data extraction. The authors did not state whether quality assessment was undertaken, which made it difficult to determine the quality of the included studies, particularly as they were all of an observation design and such studies are prone to multiple biases. The authors acknowledged that none of the included studies were optimal for assessing the impact of births with a health professional on maternal mortality. Studies were synthesised narratively, which was appropriate.

The authors’ conclusion regarding the linear relationship between maternal mortality and births with a health professional was based on only one study of unknown quality and may not be reliable. The authors’ conclusion that the included study designs were not optimal for evaluating the impact of births with a health professional on maternal mortality appears appropriate.

**Implications of the review for practice and research**

**Practice**: The authors did not state any implications for practice.

**Research**: The authors stated that greater insights can be gained by examining ecological relationships within countries and by complementing individual analyses with information on the health status of women when they first reach the health professional and whether or not the women planned to have a health professional present during the birth.

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