WHO recommendation on interventions targeted at women for the reduction of unnecessary caesarean sections

25 October 2018

Recommendation

Health education for women is an essential component of antenatal care. The following educational interventions and support programmes are recommended to reduce caesarean births only with targeted monitoring and evaluation.

(Context-specific recommendation, low-certainty evidence)

- childbirth training workshops
- nurse-led applied relaxation training programme
- psychosocial couple-based prevention programme
- psychoeducation for women with fear of childbirth

Publication history

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Remarks

Educational interventions and support programmes referred to in the included studies comprise the following, all delivered during the antenatal period.

- **Childbirth training workshops.**
  - Training comprised three four-hour weekly sessions in groups of 30 members.
  - Content included childbirth fear and pain, pharmacological pain-relief techniques and their effects, nonpharmacological pain-relief methods, advantages and disadvantages of caesarean and vaginal delivery, and indications and contraindications of caesareans, among other topics.

- **Nurse-led applied relaxation training programme.**
  - Programme comprised seven 90-minute group education sessions over seven weeks led by a nurse, under the supervision of a clinical psychologist.
○ Content included group discussion of anxiety and stress-related issues in pregnancy and the purpose of applied relaxation and deep breathing techniques, among other relaxation techniques.

- **Psychosocial couple-based prevention programme.**
  ○ The psychosocial programme consisted of nine classes, with four weekly classes conducted during the second or third trimester of pregnancy and four weekly classes conducted within the first six months postpartum.
  ○ Classes focused on emotional self-management, conflict management, problem solving, communication and mutual support strategies that foster positive joint parenting of an infant.
  ○ “Couple” in this recommendation includes couples, people in a primary relationship or other close people.

- **Psychoeducation for women with fear of childbirth.**
  ○ The psychoeducative group therapy was led by four different psychologists with special group therapeutic skills in pregnancy-related issues. Six group sessions were held during pregnancy and one was held with the newborns six to eight weeks after delivery.
  ○ Each two-hour session consisted of a focused topic and a 30-minute guided relaxation exercise using an audio recording developed for this purpose. This relaxation exercise guided the participants through stages of imaginary delivery in a relaxed state of mind with positive, calming and supportive suggestions.
  ○ The topics covered included information about fear and anxiety, fear of childbirth, normalization of individual reactions, stages of labour, hospital routines, the birth process, and pain relief (led by a therapist and midwife), among others.

- When considering the educational interventions and support programmes targeted at women to reduce caesarean births, no specific format (e.g. pamphlet, videos, role play education) is recommended as more effective. (Low- to Moderate-certainty evidence)
- Further information on the educational interventions and support programmes is presented [here](#).

The following are according to the systematic review of qualitative studies (1).

- Women think that learning new information about birth can be empowering. Women want educational tools (childbirth training workshops, booklets, decision-aids) and welcome multiple formats (although information on paper is ultimately needed for reflection with family, friends and health-care professionals).
- The content of educational materials should not provoke anxiety and needs to be consistent with advice from health-care professionals and provide the basis for more informed dialogue with them.
- Women want emotional support alongside the communication of facts and figures about birth.

**Background**

Caesarean section is a surgical procedure that can effectively prevent maternal and newborn mortality when used for medically indicated reasons. Caesarean section rates have increased steadily worldwide over the last decades. This trend has not been accompanied by significant maternal or perinatal benefits. On the contrary, there is evidence that, beyond a certain threshold, increasing caesarean section rates may be associated with increased maternal and perinatal morbidity. The factors contributing to the rise in caesarean section rates are
complex, and identifying interventions to address them is challenging. The sustained, unprecedented rise in caesarean section rates is a major public health concern. (2-6) There is an urgent need for evidence-based guidance to address the trend. Clinical interventions that could help to reduce caesarean section rates have been addressed in previously published WHO guidelines. Until now, there have been no global guidelines on non-clinical interventions (defined as interventions applied independently of a clinical encounter between a health-care provider and a patient in the context of patient care). Evidence-based recommendations on non-clinical interventions specifically designed to reduce caesarean section rates are provided here. (Interventions not specifically designed to reduce caesarean section rates are not included, even if they may incidentally reduce caesarean section rates.) (7,8)

Methods

This recommendation was developed in accordance with standard procedures set out in the WHO handbook for guideline development.

Evidence on the effectiveness of interventions was derived from an updated Cochrane review of 29 studies. Judgements about values, acceptability, equity, resource implications and feasibility of interventions were informed by three systematic reviews of 49 qualitative studies. The certainty of evidence on safety and effectiveness outcomes was assessed using Grading of Recommendations Assessment, Development and Evaluation (GRADE). Confidence in the qualitative findings was assessed using Confidence in the Evidence from Reviews of Qualitative research (CERQual). The framework for Developing and Evaluating Communication strategies to support Informed Decisions and practice based on Evidence (DECIDE) was used to integrate and present research evidence (benefits and harms of interventions) and relevant considerations (values, acceptability, equity, resource implications and feasibility) to the Guideline Development Group (GDG). The GDG convened in September 2017 in Geneva, Switzerland, to review the summarized evidence and formulate recommendations. (9-15)

Further information on procedures for developing this recommendation are available here

Recommendation questions

- Do non-clinical educational interventions (e.g. educational games, materials, meetings) (I) reduce caesarean rates (O) in groups of low-risk women (P) compared with usual care (C)?
- Does the mode or format of communication affect the effectiveness of non-clinical education (e.g. information and communication technology, written, radio, television)?
- Does the use of opinion leaders (I) reduce caesarean rates (O) in groups of low-risk women (P) compared with usual care (C)?
- Does public dissemination of caesarean rates (I) reduce caesarean rates (O) in groups of low-risk women (P) compared with usual care (C)?

Evidence summary

Evidence on non-clinical educational interventions targeted at women was derived from 15 RCTs (16-30) included in the Cochrane review update: 12 trials compared specific educational interventions with usual practice and three trials compared different formats of educational interventions.

Most studies were done in high-income countries (Australia, Canada, Finland, Sweden, the United Kingdom and the United States; 9 studies). Six studies were done in middle-income countries (China, the Islamic Republic of Iran). There were no studies from low-income countries. Eight studies included only nulliparous
women (16,17,19,21–24, 28). Four studies included only women with a previous caesarean (25,26,29,30). The remaining three studies included a mixed population of women (18,20,27). Four of the educational interventions were studied in groups of women with fear of childbirth – psychoeducation (24), intensive group therapy (cognitive behavioural therapy and childbirth psychotherapy) (27), psychoeducation by telephone (22), and role play education versus standard education using lectures (28). The nurse-led applied relaxation training programme (24) was studied in women with high levels of anxiety. The remaining interventions were studied in women (or couples) with no specific health condition.

Descriptions of the interventions are summarized in Web annex 2, Table 1.

A narrative synthesis of the effect of the interventions was undertaken (the heterogeneity in the examined educational interventions precluded meta-analysis). The following educational interventions were assessed.

**Education, birth preparation classes and support programmes**

**Nulliparous women**

- Antenatal education on natural childbirth preparation with training in breathing and relaxation techniques (16).
- Childbirth training workshop (17).
- Psychosocial couple-based prevention programme (19).
- Pelvic floor muscle training (PFMT) exercises with telephone follow-up (21).
- Psychoeducation for women with fear of childbirth (22).
- Prenatal education for partners of pregnant women (23).
- Nurse-led applied relaxation training programme (24).

**Mixed population of women (nulliparous and multiparous women with or without previous caesarean sections)**

- Psychoeducation by telephone for women with fear of childbirth (20).
- Intensive group therapy (cognitive behavioural therapy and childbirth psychotherapy) for women with fear of childbirth (27).

**Women with a previous caesarean section**

- Computer-based decision aids (information programme, decision analysis) (25).
- Decision-aid booklet (26).

Women in the control group received routine maternity care in accordance with local protocols. PFMT with telephone follow-up was compared with PFMT without telephone follow-up.

**Different formats of educational interventions**

**Nulliparous women**

- Role-play education (versus standard education using lectures) for women with fear of childbirth (28).

**Women with a previous caesarean section**

- Interactive decision aid (versus educational brochures) (29).
- Individualized prenatal education and support programme (versus written information in a pamphlet)
Effects of the interventions (Web annex 3, Table 1)

Education, birth preparation classes and support programmes

Nulliparous women

Three interventions were found to reduce caesarean section rates.

- Childbirth training workshop (mothers alone versus control: risk ratio [RR] 0.55, 95% confidence interval [CI] 0.33 to 0.89; couple versus control: RR 0.59, 95% CI 0.37 to 0.94; 60 women, Low-certainty evidence) (17).
- Psychosocial couple-based prevention programme (odds ratio 0.36, 95% CI 0.15 to 0.86; 147 women, Low-certainty evidence) (19).
- Nurse-led applied relaxation training programme (RR 0.22, 95% CI 0.11 to 0.43; 104 women, Low-certainty evidence) (24).

Two interventions were found to increase rates of vaginal births.

- Childbirth training workshop (mothers alone versus control: RR 2.25, 95% CI 1.16 to 4.36; couple versus control: RR 2.13, 95% CI 1.09 to 4.16; 60 women, Low-certainty evidence) (17).
- Psychoeducation for women with fear of childbirth (RR 1.33, 95% CI 1.11 to 1.61; 371 women, Low-certainty evidence) (21).

There were no differences in caesarean section rates between routine maternity care and the following interventions.

- PFMT with telephone follow-up (versus PFMT without telephone follow-up) (RR 0.87, 95% CI 0.37 to 2.04; 90 women, Low-certainty evidence) (20).
- Psychoeducation for women with fear of childbirth (RR 0.70, 95% CI 0.49 to 1.01; 371 women, Low-certainty evidence) (21).
- Antenatal education on natural childbirth preparation with training in breathing and relaxation techniques (elective caesarean: RR 0.95, 95% CI 0.58 to 1.56; emergency caesarean: RR 0.91, 95% CI 0.67 to 1.23; 977 women, Moderate-certainty evidence) (22).

The effect of prenatal education for partners of pregnant women on caesarean births is uncertain (22).

Mixed population of women (nulliparous and multiparous women with or without previous caesarean sections)

There were no differences in caesarean section rates between routine maternity care and the following interventions.

- Intensive group therapy (cognitive behavioural therapy and childbirth psychotherapy) for women with fear of childbirth (RR 0.90, 95% CI 0.65 to 1.24; 176 women, Low-certainty evidence) (27).
- Antenatal education programme for physiological childbirth (RR 1.03, 95% CI 0.72 to 1.49; 150 women, Moderate-certainty evidence) (28).

The effect of psychoeducation sessions by telephone for women with fear of childbirth on caesarean births is uncertain (20).
**Women with a previous caesarean section**

There were no differences in caesarean section rates between routine maternity care and the following interventions:

- Computer-based decision aids (information programme, decision analysis) (information group versus usual care group, elective caesarean: RR 0.98, 95% CI 0.82 to 1.18, 478 women; emergency caesarean: RR 1.09, 95% CI 0.77 to 1.55, 478 women; decision analysis group versus usual care group, elective caesarean: RR 0.83, 95% CI 0.68 to 1.02, 473 women; emergency caesarean: RR 1.05, 95% CI 0.74 to 1.50, 473 women; Moderate-certainty evidence) (25).
- Decision-aid booklet (absolute change from baseline 26.2%, versus control 22.6%; 227 women, Moderate-certainty evidence) (26).

Limited data were available on the effect of the interventions on maternal and neonatal mortality and morbidity.

**Different formats of educational interventions**

Data from three studies comparing different formats of educational intervention showed little or no differences in rates of caesarean section or vaginal birth after caesarean (VBAC) between formats:

**Nulliparous women**

- Role play versus standard education using lectures for women with fear of childbirth (caesarean: RR 0.66, 95% CI 0.39 to 1.12; 67 women, Low-certainty evidence) (28).

**Women with a previous caesarean section**

- Interactive decision aid versus educational brochures (VBAC: 41% versus 37%; number of participants unclear, Low-certainty evidence) (29).
- Individualized prenatal education and support programme versus written information in a pamphlet (VBAC: RR 1.08, 95% CI 0.97 to 1.21; 1275 women, Moderate-certainty evidence) (30).

Maternal and neonatal morbidity and mortality (where reported) were similar between study groups.

**Values** ([Web annex 4, Table 1](#))

A qualitative evidence synthesis of women’s views and experiences with non-clinical educational interventions to reduce unnecessary caesarean (1) informed this domain. Most of the evidence came from studies conducted in high-income countries. The findings show that women and communities want educational booklets, workshops and decision aids conveying their lived experiences of birth (including the physical demand of labour and the social and emotional impact of vaginal birth and caesarean section) (High confidence in high-income countries; Moderate confidence all countries). Some women experience important gaps in information relating to specific birth choices, particularly in relation to home birth and VBAC. Women also want educational provision to include greater acknowledgment of labour and vaginal birth as an important and valuable life experience.

**Resources**
One RCT compared the cost in Finland of group psychoeducation with that of conventional care for women with fear of childbirth (31). There were no differences between the groups in total direct costs (€3786 per woman in the psychoeducation group versus €3830 per woman in the control group).

**Cost-effectiveness**

No research evidence was identified on the cost-effectiveness of educational interventions.

**Equity (Web annex 4, Table 1)**

No direct evidence was identified on the impact on equity of implementing educational interventions. Indirect evidence from the qualitative review of women’s views and experiences (1) shows that women want multiple modes and formats of educational intervention (Moderate confidence) with different women having different levels of literacy, comprehension or requisite skills and access to electronic resources (including printing facilities).

Women who have experience of electronic educational interventions report an unmet need for printed copies to reflect on, revisit and share during subsequent discussions with family, friends and healthcare professionals. The five studies contributing to this domain were all from high-income countries (Taiwan [China], the United Kingdom and the United States) (1). Further evidence from the qualitative review indicates that women and communities have wide-ranging views on the use of appropriate language, figures and tables to communicate information across intervention formats. The importance of health literacy (in respect of familiarity with medical terms) and readability considerations – including Simple Measurement of Gobbledygook (SMOG), a widely used formula to determine how easy written health education materials are to read and comprehend (32) – were reported in the design of some interventions. Video content was largely welcomed where it facilitated the visualization of positive, actual birth experiences. In one study, however, most women did not distinguish the usefulness of the video intervention over the standard information leaflet provided by the hospital, although two women did comment on the video’s relevance for women with low levels of literacy. Many women could see the benefits of computer-based interventions, but ease of use was problematic for some, and pregnant women in particular still wanted information in paper format too.

**Additional considerations**

In settings where the majority of women are in contact with the health system or where prenatal education is provided through community health workers, educational interventions may increase equity. On the other hand, in settings where access is a barrier to antenatal care, prenatal education may decrease equity. In the case of educational interventions targeting partners, women who are separated/divorced, and single mothers, may not benefit from these interventions.

**Acceptability (Web annex 4, Table 1)**

Findings from the qualitative review (1) show that women like learning new information about birth (High confidence in high-income countries; Moderate confidence in all countries) with the content and design of interventions opening up new ways of thinking about caesarean section, labour and vaginal birth for women. Some women were surprised by the actual number of caesarean sections performed. The new knowledge and support communicated can be empowering for women (Moderate confidence), although they also desire emotional support alongside the communication of facts and figures about birth (Moderate confidence), because some women experience educational intervention content as anxiety provoking (Moderate confidence). Use of a decision aid and follow-up by a midwife helped to mediate pregnant women’s concerns in one study, but in another study midwives who failed to take women’s concerns seriously added to their fears.

Further evidence from the qualitative review (1) shows that educational interventions are only one
component informing women’s and communities’ views and decision-making about birth (Moderate confidence). Women are exposed to a multiplicity of information sources before, during and after pregnancy. Some women use decision aids as a springboard for seeking more information. Learning from the birth stories of families and friends is widespread, as is gleaning information from the media and actively seeking it from the Internet. Face-to-face interactions with health-care professionals were experienced as the most important influence on actual birth method.

Although women want all modes and formats of educational interventions in preparation for birth (Moderate confidence), intervention content is most useful when it (Moderate confidence):

- complements clinical care
- is consistent with advice from health-care professionals
- provides a basis for more informed, meaningful dialogue between women and care providers.

Additional considerations

No research evidence was found relating to acceptability among partners. Issues may include problems with the investment of time or with a lack of opportunity to be released from work to attend sessions, and social stigma in cultures where men are not traditionally included in pregnancy and birth.

Feasibility (Web annex 4, Table 1)

Findings from the qualitative review (1) show that women are aware of how the organization of care and information impacts on the actual choices available to them (Moderate confidence), with a few women, from different settings, reporting having to fight for their preferred birth method (vaginal or caesarean). This is likely to affect the feasibility of the women being able to enact their choices no matter what educational intervention they receive. Women’s attitudes towards involvement in decision-making vary (Moderate confidence). Some women are highly motivated to be involved in decision-making, others are uncertain of their role, and still others want a health-care professional to make the decision about birth method for them. This may impact on the feasibility for funders/providers of supporting sessions or resources that meet the needs of all women in a range of diverse local contexts.

Additional considerations

In settings where educational sessions are provided in locations that are difficult to access, or expensive in terms of transportation, or where “under the counter” payments are demanded for services, it may not be feasible for some women to access the sessions (33). No research evidence was found relating to the feasibility of involving partners in educational interventions. Issues may include problems with the investment of time or with a lack of opportunity to be released from work to attend sessions, and difficulty or expense of travel to the venue.

Further information and considerations related to this recommendation can be found in the WHO guidelines, available at:

- Web annex 3: GRADE evidence tables
- Web annex 4: CERQual evidence tables

Implementation considerations

A number of factors (barriers) may hinder the effective implementation and scale-up of the recommendations in this guideline. These factors may be related to the behaviours of patients (women or
families), the behaviour of health-care professionals, to the organization of care, health service delivery or to financial arrangements.

The barriers were identified from case studies and systematic reviews exploring factors affecting the implementation of interventions to reduce caesarean section rates (34–36). Additional barriers were identified from qualitative reviews undertaken for this guideline (1–37) and Cochrane overviews of reviews of health system implementation, care delivery arrangements and financial strategies (38–40).

Further information on implementation considerations are available [here](#).

**Research implications**

The Technical Working Group and Steering Group identified areas where further studies are needed based on four broad considerations:

1. uncertainty in the effects of the interventions due to evidence of very low or low certainty;
2. concerns with the applicability of the evidence (particularly as most interventions were assessed in single studies; the interventions would benefit from replication in other settings);
3. lack of studies for predefined guideline questions; and
4. promising interventions not specifically designed to reduce caesarean births that would benefit from examination in areas with high caesarean section rates (e.g. continuous one-to-one intrapartum support).

Additional research questions were proposed by the Guideline Development Group (GDG) during the face-to-face consultative meeting. In particular, the GDG emphasized that future intervention trials should be preceded with formative research to define locally relevant determinants of caesarean births.

Multifaceted (rather than single-component) interventions tailored to local determinants (barriers and facilitators) of caesarean section practices are recommended.

The certainty of evidence for caesarean section outcome was low to very low for the following interventions.

Further studies are needed to address the uncertainty in the effect of these interventions:

- Education, birth preparation classes and support programmes.
- Psychoeducation by telephone.
- Prenatal education for partners of pregnant women.
- Different formats of educational interventions (decision support tools).

**Related links**

[WHO recommendations: non-clinical interventions to reduce unnecessary caesarean sections (2018)](#)

[Non-clinical interventions for reducing unnecessary caesarean section: Cochrane review](#)

[Women's and communities' views of targeted educational interventions to reduce unnecessary caesarean section: a qualitative evidence synthesis](#)
Non-clinical interventions to reduce unnecessary caesarean section targeted at organisations, facilities and systems: Systematic review of qualitative studies

Related publications

Robson Classification: Implementation Manual

More documents on maternal health

Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors

Pregnancy, Childbirth, Postpartum and Newborn Care: A guide for essential practice

WHO Programmes: Sexual and Reproductive health

References

1. Kingdon C, Downe S, Betrán AP. Women’s and communities’ views of educational interventions targeted at them to reduce unnecessary caesarean section: a qualitative evidence synthesis. BJOG. 2018


29. Eden KB, Perrin NA, Vesco KK, Guise JM. A randomized comparative trial of two decision tools for


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