

# Factors behind high caesarean section in Bangladesh: insight from a systematic literature review and meta-synthesis

Mohammad Ali <sup>1,2</sup>, Ashley Younger,<sup>1</sup> Nicole Votruba,<sup>1</sup> Jane E Hirst <sup>1,3</sup>

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## ABSTRACT

**Objectives** The caesarean section (CS) rate in Bangladesh surged by 42% in 2022 compared with the prior year. This study aimed to identify the main factors influencing CS decision-making in Bangladesh.

**Design** Systematic review.

**Data sources** Global Health, PsycINFO, EMBASE, Medline and PubMed were systematically searched, and 308 studies were initially identified.

**Eligibility criteria** Full-text original studies addressing the CS decision-making process in Bangladesh were included. There were no restrictions on study design and publication year. Non-English publications and studies conducted outside of Bangladesh were excluded.

**Data extraction and synthesis** Four qualitative and two mixed-methods studies met the full inclusion criteria. The included studies generated exclusively qualitative data; therefore, verbatim qualitative data were extracted and meta-synthesis was performed to identify themes. Finally, themes were mapped onto five levels of Bronfenbrenner's ecological systems theory (microsystem, mesosystem, exosystem, macrosystem and chronosystem).

**Results** Across the studies, 158 participants were involved, including women, their family members and clinicians. The factors related to pregnant women (microsystem)—fear of childbirth; people (mesosystem)—family and community influences; clinicians and healthcare system (exosystem)—maternal preference, previous CS, fear of litigation, lack of accountability among obstetricians, lack of skills among nurses, lack of resources, absentee staff, disrespectful labour care, private agents activities; culture (macrosystem)—role of traditional birth attendants; time and life transition (chronosystem)—CS emerged as 'better'.

**Conclusions** The drivers for CS in Bangladesh are complex, and interventions to reduce overuse high rates will need to address more than 'health provider preference'. However, with only six relatively small studies identified, there is insufficient data to inform programmatic direction. In a country with 3 million births annually, there is a need for large-scale studies to quantify the main factors contributing to high CS rates in both the public and private sectors.

**PROSPERO registration number** CRD42023490645.

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Factors influencing decision-making for caesarean section (CS) are complex.
- ⇒ WHO emphasises the importance of understanding local factors that lead to high CS rates before implementing any intervention to reduce them.

## WHAT THIS STUDY ADDS

- ⇒ Identifies major factors influencing Bangladesh CS rates from the perspectives of key stakeholders, for instance, women who have undergone CS and clinicians from both the public and private sectors.
- ⇒ Almost all factors are non-medical, viz no clinical indication for CS.
- ⇒ Some new observations emerge: high elective CS rates in morning shifts at public hospitals, attributed to staff absences and understaffing later in the day; private sector agents touting for CS inside public sector settings; junior doctors accusing obstetricians of a lack of accountability for high CS rates; and clinicians in private clinics accusing nurses of lacking necessary skills for vaginal deliveries.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Findings suggest several potential interventions for women, healthcare providers and the healthcare system to optimise the use of CS in the context of Bangladesh.
- ⇒ Further study required to determine 'leverage points' to influence CS rates in both public and private sectors.



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<sup>1</sup>Nuffield Department of Women's & Reproductive Health, University of Oxford, Oxford, UK

<sup>2</sup>College of Nursing, International University of Business Agriculture and Technology, Dhaka, Bangladesh

<sup>3</sup>Imperial College London, The George Institute for Global Health UK, London, UK

## Correspondence to

Mohammad Ali;  
mohammadali8816@gmail.com

## INTRODUCTION

Caesarean section (CS), a life-saving intervention for women and babies, is one of the most common surgical procedures globally.<sup>1</sup> About one in five women in the world gives birth by CS; this is predicted to rise by 2030 to one in three women giving birth via CS (38 million CS annually).<sup>2</sup> Notably, 33.4 million CS deliveries will occur in low- and middle-income countries (LMICs).<sup>2</sup> Some countries have already experienced remarkable increases in CS, such as the Dominican Republic, Brazil,

Cyprus, Egypt and Turkey, where more than 50% of all births are by CS.<sup>2</sup>

The ideal CS rate remains unclear. In 1985, the WHO recommended that CS rates above 15% do not reduce maternal and neonatal mortality.<sup>3</sup> However, in 2015, the WHO updated its recommendation to state that ‘every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate’.<sup>4</sup> At the same time, Dr Ana Pilar Betran, who leads the WHO CS campaign, emphasised that there is no benefit to mothers and their babies when CS is performed without a proper medical indication.<sup>5</sup> Betran argues that CS is associated with risks of serious operative complications like any other operation.

Bangladesh, a lower-middle-income country in South Asia, has made remarkable progress in maternal and perinatal health over the last decade. According to the Bangladesh Demographic and Health Survey of 4000 live births across the country, the average proportion of facility-based childbirth increased from 29% in 2011 to 65% in 2022, skilled birth attendance rose from 31% to 50%, the maternal mortality ratio declined from 574 per 100000 live births to 136 and the neonatal death rate declined from 48 per 1000 live births to 16.<sup>6</sup> During this period, the delivery by CS rate increased from 18% to 45%, with CS rates exceeding 50% in some divisions (Khulna, Rajshahi and Dhaka), while other regions registered rates below 40% (the lowest at 25% in the Sylhet division).

The underlying causes of high CS rates in Bangladesh are not clearly understood. The existing global literature suggests that a combination of complex factors at the individual, societal and healthcare facility levels influences decision-making for CS.<sup>7</sup> However, these decision-making factors can differ significantly between countries due to variations in healthcare systems and dynamics, cultural practices and specific challenges related to perinatal care. The WHO emphasises the importance of understanding local factors that influence decision-making on CS rates before implementing any intervention.<sup>8</sup> Consequently, this study aims to review and analyse existing literature on CS in Bangladesh to gain

an in-depth understanding of the following key aspects of decision-making: women’s perception about CS, the degree of women’s choice and informed decision, the role of clinicians’ counselling and recommendation, and the influence of family members and culture. Moreover, the study focuses on how the healthcare system (such as facility type and availability of services and practices) influences the CS decision-making process. The findings will have programmatic implications as they will inform potential intervention strategies to promote the optimal use of CS.

**METHODS**

This systematic literature review was performed according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines<sup>9</sup> and was prospectively registered on PROSPERO (ID: CRD42023490645).

**Eligibility criteria**

Full-text original studies addressing the CS decision-making process in Bangladesh were included. There were no restrictions on study methods or publication years. Review papers, protocols, books, chapters, preprints, editorials, opinions, abstracts, letters and commentaries were excluded because they lacked original research. Non-English publications and studies conducted outside of Bangladesh were excluded.

**Search strategies**

A comprehensive search strategy was developed in consultation with an experienced librarian. The PICO guideline (population, intervention, comparison and outcomes) was applied to guide the search strategy (table 1).<sup>10</sup> The following key search terms were generated: (cesarean or caesarean or c-section\*) AND (plan\* or elective or determin\*) AND (decision\* or decid\* or agree\* or choos\* or choice\* or chose\* or determine\* or select\* or prefer\* or request\*) AND (Bangladesh). The following five databases (Global Health, PsycINFO, EMBASE via Ovid, Medline via Ovid and PubMed) were searched from 10 November 2023 to 30 January 2025. Moreover, grey literature was searched on official

**Table 1** PICO guideline

P	Population	Stakeholders who are involved in the CS decision-making process: 1. Women and their families (eg, husband, mother/fathers-in-law) 2. Healthcare professionals: medical officers, obstetricians, gynaecologists, midwives, nurses, community-based skilled birth attendants, pharmacists, community healthcare providers and paramedics 3. Unregistered healthcare providers: traditional birth attendants, local village doctors, medicine sellers in the pharmacy and traditional healers
I	Intervention	Studies addressed the CS decision-making process in Bangladesh
C	Comparison	Not applicable
O	Outcomes	Rate or odds of CS associated with identified factors (quantitative data). Participants’ quotes focus on the CS decision-making process (qualitative data)
CS, caesarean section; TBA, traditional birth attendants.		

websites, including the Ministry of Health, the Midwifery Society, and the Obstetricians and Gynaecologists Society of Bangladesh. The reference lists of all included studies were scanned for additional studies (see online supplemental file 1:appendix 1 for details).

### Selection process

The first and second authors (MA and AY) independently screened the titles, abstracts and full texts (as appropriate) of the extracted publications using Covidence Software. Disagreements regarding study inclusion were resolved through discussion and, when necessary, by consulting the third author (NV). All exclusion decisions were documented in Covidence.

### Data extraction

A Microsoft Excel spreadsheet was used to collect the following criteria from the studies: citation, study design, sampling, sample size, participant characteristics (age, education, occupation, family income/month), clinician characteristics (eg, age and years of experience), data collection locations, data collection method, data analysis and participants' quotes describing their CS decision-making process. However, the outcome variables (ratios or odds) were not extracted because no quantitative data were reported on the CS decision-making process.

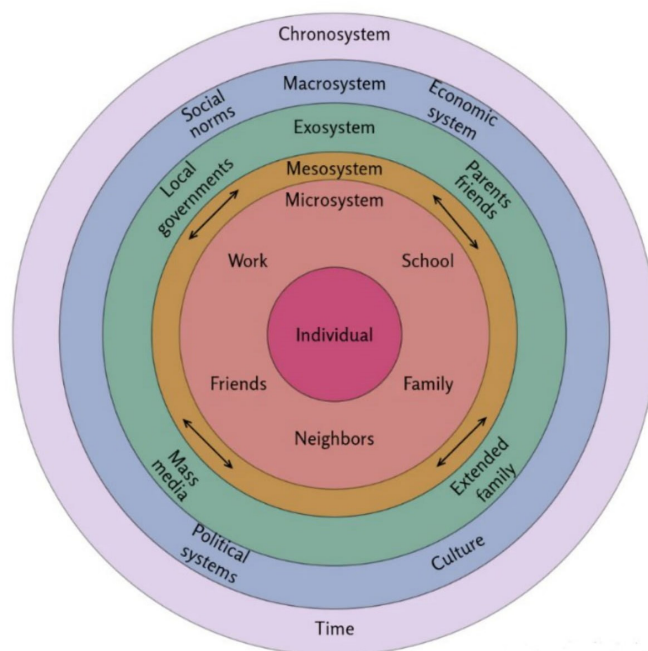
### Methodological quality assessment (risk of bias assessment)

The Mixed-Method Appraisal Tool (MMAT) was applied to assess the methodological quality of studies.<sup>11</sup> The tool allows appraisal of the most common study designs (eg, qualitative, quantitative and mixed-methods) using five study design-specific criteria (see online supplemental file 1:appendix 2). Each criterion was judged as either 'no=0 point' (criteria did not meet), 'yes=1 point' (criteria met) or 'can't tell=insufficient information'. Two reviewers (MA and AY) performed the quality appraisal independently in Microsoft Excel.

### Synthesis methods

Given that all extracted data were qualitative, meta-synthesis was appropriate, a form of thematic synthesis that aims to combine findings from various primary qualitative studies to create new themes within the focus of the review.<sup>12</sup> NVivo V.14, a qualitative data analysis software, was used for the synthesis, which comprised four steps. First, the extracted participants' quotes were read multiple times to gain a comprehensive understanding of the dataset across studies. Second, the data representing factors influencing participants' CS decisions were coded using predetermined codes from the existing literature (online supplemental file 1:appendix 3).<sup>13–17</sup> When existing predetermined codes did not match the data, new codes were generated. Third, the codes were sorted and grouped into categories.

The final step was to develop analytic themes to generate new interpretations aligned with the review objectives, which is considered a central part of the meta-synthesis. Bronfenbrenner's ecological system theory was



**Figure 1** Socioecological model of Bronfenbrenner.

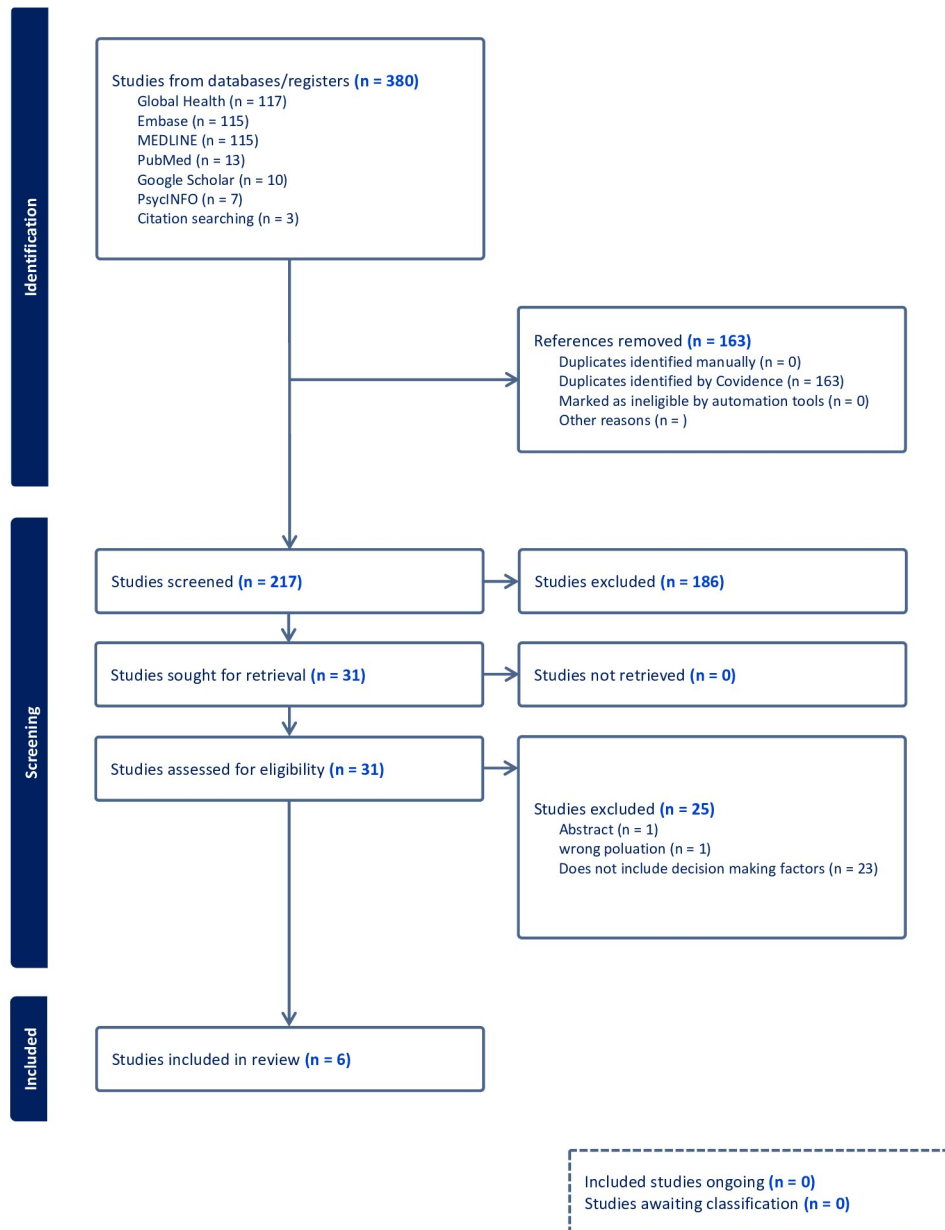
applied to generate analytic themes (see figure 1).<sup>18</sup> This theory has been widely adopted in healthcare research to understand the interrelations of multilevel factors that determine health behaviours or decisions.<sup>19–21</sup> It identifies five major levels of influence on individual decisions: microsystem (eg, age, gender, personal experiences, beliefs), mesosystem (eg, family and friends), exosystem (eg, laws, policies, organisations), macrosystem (culture and traditions) and chronosystem (time dimension including life transitions, historical events and societal changes) (figure 1). In this review, key categories were mapped on five layers of the Bronfenbrenner framework: pregnant women (microsystem), people (mesosystem), clinicians and healthcare system (exosystem), culture (macrosystem) and time and life transitions (chronosystem).

### Assessing confidence in the review findings

The GRADE-CERQual approach was used to evaluate our confidence in each finding based on four key components (methodological limitations, coherence, adequacy and relevance).<sup>22</sup> Four components were judged as (1) no or very minor, (2) minor, (3) moderate and (4) serious concerns. Based on the four judgments, an overall confidence rating was assigned as follows: high, moderate, low or very low.

### Patient and public involvement

Patient and public involvement, including ethical approval, was not necessary for this review, as it was based on a secondary analysis of published literature. We removed all identifiable participant information, such as names, contextual details, location and job titles.



**Figure 2** Preferred Reporting Items for Systematic Reviews and Meta-Analyses flowchart of the study selection process.

**RESULTS**

**Study selection**

A total of (n=380) papers were initially identified and imported into Covidence software. Duplicate studies were automatically removed. After eliminating 163 duplicates, the first and second authors (MA and AY) independently screened the titles and abstracts of the existing 217 articles. Of these, 186 did not meet the inclusion criteria, leaving 31 articles for full-text reviews. Of these, six studies published between 2014 and 2024 were eligible and included in the review. The remaining full-text articles were excluded because they did not report factors related to CS decision-making (figure 2).

**Study characteristics**

Geographical locations: three studies were conducted in Dhaka city, the capital of Bangladesh.<sup>23-25</sup> Three studies

were conducted in different semi-urban locations across the country.<sup>26-28</sup>

Methods: two were mixed methods<sup>27 28</sup> and four were qualitative designs.

Sampling: the lowest sampling was 12<sup>25</sup> and the highest was 46.<sup>26</sup>

Participants: most were women who had elective CS (n=67), followed by 32 healthcare practitioners, mainly obstetricians. Participants were from public and private settings. All women were from low socioeconomic backgrounds, except for one study.<sup>23</sup>

Data collection: five studies employed in-depth interviews, while one combined focus group discussions and in-depth interviews.<sup>26</sup>

Data analysis: thematic analysis was performed in all six studies (see table 2 for details).

**Table 2** Key characteristics of the included studies

Study	Location (urban/semi-urban/rural)	Design	Data collection method	Participants' number	Facility type	Participant's monthly income*	Participant's highest level of education*
Akhter and Schech <sup>23</sup>	Dhanmondi city, Dhaka (urban)	Qualitative	Semi-structured interview	Women who had elective CS (N=30), Medical staff (N=3)	Private clinics	BDT 195 600 (US\$2794)	All had at least some level of tertiary (bachelor's degree) education
Sultana <i>et al</i> <sup>24</sup>	Four slums in Dhaka city (urban)	Qualitative	In-depth interview	Women who had elective CS (N=7), husbands (N=5), mother-in-law (N=5), other members (N=2)	Public hospitals	BDT 6000–45 000 (US\$76–573)	All had either primary or no education
Hairon <i>et al</i> <sup>25</sup>	Dhaka (urban)	Qualitative	In-depth interview	Obstetricians (N=12)	Private and NGOs	Not applicable	Not applicable
Begum <i>et al</i> <sup>26</sup>	Matlab, a sub-district of Chandpur district (semi-urban)	Qualitative	Four FGD with pregnant women. In-depth interviews with women who had CS and obstetricians	Pregnant women (N=26), women who had elective and emergency CS (N=14), obstetricians (N=6)	Public and private clinics	BDT 10 000–47 292 (US\$77–384)	Six had below higher secondary level, three secondary level and five had no formal education
Aminu <i>et al</i> <sup>27</sup>	Thakurgaon District (semi-urban)	Mixed-methods	In-depth interviews	Obstetricians, anaesthetists, medical officers, nurses, midwives (N=18)	Public	Not applicable	Not applicable
Doraiswamy <i>et al</i> <sup>28</sup>	Multiple places across the country (semi-urban)	Mixed-method	In-depth interview	Obstetricians (N=16), women who had elective CS (N=16), women who had emergency CS (N=16)	Public district hospitals	Data were not found	Most had no education

\*Excluding healthcare providers.

CS, caesarean section; FGD, focus group discussion; NGO, non-government organisation.

### Methodological quality (risk of bias)

Four qualitative studies were assessed using the MMAT qualitative study design-specific five appraisal criteria. Two qualitative studies met all five MMAT qualitative criteria.<sup>25 26</sup> One qualitative study met four of the five criteria, as the study presented extensive participant quotations without clear interpretation.<sup>24</sup> Another

qualitative study met three of five criteria because participating women reflected on their CS experience 4–5 years before data collection, which could introduce recall bias.<sup>23</sup> Two mixed-method studies were assessed using the MMAT mixed-method appraisal five criteria. One met all five criteria<sup>28</sup> and one met three of five criteria due to potential bias or imbalanced representation in the

findings<sup>27</sup> (see online supplemental file 1:appendix 4 for details).

### Confidence in the review findings

We identified five key themes. Using the GRADE-CERQual approach, we evaluated themes 2, 3 and 5 as having moderate confidence and themes 1 and 4 as low confidence (see online supplemental file 1:appendix 5). Our primary concerns related to the relevance of the supporting studies and the sufficiency of the data. The findings were based on a small number of studies with limited data richness and notable methodological limitations.

## THEMES

### Theme 1: findings for the pregnant women (microsystem): fear of natural birth (low confidence)

One reason why several women, mostly from affluent families living in urban areas, chose an elective CS was a strong fear of labour pain and losing control during the vaginal delivery process.<sup>23</sup> Women living in semi-urban areas, on the other hand, feared perineal injuries during vaginal delivery due to traumatic previous experience.<sup>26</sup> A first-time mother from an affluent family said,

I had a desire for CS from the beginning. I am a bit weak type lady. I was fearful that when something has to come out from the bottom [whether] I will be able to push. If I lose my confidence halfway through, what will happen then? (Aged 31, mother of one child)<sup>23</sup>

Women from affluent families were also afraid of the entire labour process. This intense fear led them not only to have a planned CS but also to express a desire to limit their pregnancy.

I chose to have a CS, because I know that I will have only one child, I don't want any more babies. So why take the hassle of labour? (Mother's age was not mentioned)<sup>23</sup>

Notably, the above women underwent elective CS in the private sector. None mentioned feeling afraid of the CS procedure itself. Furthermore, no woman discussed seeking treatment or being offered interventions by their clinicians to alleviate their fear of vaginal birth.

### Theme 2: findings for people (mesosystem): family and community influences (moderate confidence)

#### Family influence

Family influence appeared to be a factor among urban women from affluent families.<sup>23</sup> For example, if a close family member had a CS, other women in the same family were more likely to consider a CS. Notably, women were interested in undergoing CS with the same clinicians who had performed the procedures on other members of their families. A multiparous woman who had an elective CS in the private sector reported,

From the very beginning my target was to see Dr. B (consulting doctor). She did my elder sister's CS. She also did

CS for many of our relatives. (Aged 39 years, mother of two children)<sup>23</sup>

Moreover, support from senior female members throughout the pregnancies and childbirth has been changing over time. A woman living in an urban area who chose an elective CS in a private facility reported,

I had no one else, like a murubbi [*senior family members, for example, mother-in-law*], who could have advised me what to do or what not to do. So I took the decision one night and went for CS. (Mother, aged 37, of one child)<sup>23</sup>

#### Community influence

Local anecdotes about CS from community sources influenced some rural women's decision to undergo a planned CS.<sup>26 28</sup> A woman who underwent an elective CS in a public district hospital reported,

My friends also had a CS operation, it was safe and for this reason, I had the desire to do mine. (Women's ages and number of children were not reported)<sup>28</sup>

## THEME 3

### Subtheme 3.1: findings for clinicians (exosystem): maternal request CS, previous CS, fear of litigation and lack of accountability (moderate confidence)

#### Maternal request CS

Some clinicians working in private clinics in urban and semi-urban areas reported that maternal preference was a key factor influencing their decision to perform a CS.<sup>23 26 27</sup> An obstetrician from the private sector said,

When the pain started, she could not stand it and requested CS. We have 50% of all CS on request.<sup>23</sup>

Conversely, obstetricians from the public sector working in semi-urban areas mentioned that they received requests from women to have a CS delivery of their dead fetus.<sup>26</sup>

However, women often consider the dead fetus as a poison within the womb and request for caesarean section within the shortest possible time. I get surprised having similar request from multiple cases in the recent past where my counselling did not work. (Quote from obstetrician)<sup>26</sup>

#### Previous CS

Women with a history of CS influenced some private clinicians' decision-making to perform elective CS.<sup>25 27</sup> These clinicians provided several reasons for performing repeat CS, including women's fear of vaginal delivery after CS (VBAC) and the clinicians' own fear of VBAC complications.

We counsel the patients about the risk factor of the patient for VBAC [*vaginal delivery after CS*] they deny [*decline*]. This is the most common barrier to conduct the VBAC here. (Consultant, private hospital)<sup>25</sup>

Clinicians working in private settings located in Dhaka also reported their concerns about the lack of resources to treat VBAC complications immediately.

If any problem, then we take care of the patient and CS done quickly. This is not possible in our hospital. (Consultant, private hospital)<sup>25</sup>

#### Fear of litigation

Clinicians from both public and private settings expressed intense concern over accusations of medical negligence if a baby was injured during vaginal birth.<sup>25 27</sup>

Doctors are going to the jail before any investigation, so that is very much tragic. (Consultant, private hospital)<sup>25</sup>

The experiences reported by obstetricians from the public sector were similar.

If the baby suffers asphyxia because of delay, [parents] ask why CS was done late. (Obstetrician #5)<sup>27</sup>

#### Lack of accountability

Some obstetricians from private settings reported nurses' lack of skills and lax monitoring as one of the reasons for performing CS.<sup>26</sup>

We usually do not take risks when there is 50/50 chance of vaginal delivery even in the private clinics, as nurses working there are reluctant to do regular follow up and are not competent to manage normal delivery. My whole career will be ruined for a single fetal death. (Quote from obstetrician)<sup>26</sup>

At the same time, some junior doctors from the public sector working in semi-urban areas accused senior clinicians of a lack of adherence to hospital protocols.<sup>27</sup>

But I think there are many big professors, big gynecologists (who) do not follow protocol. Their interest is CS. (MO #4)<sup>27</sup>

### Subtheme 3.2: findings for the healthcare system (exosystem): lack of resources, disrespectful obstetric care, private sector touting (moderate confidence)

#### Lack of resources

Many providers cited lack of resources as a reason to perform CS deliveries, particularly in public hospitals, including the unavailability of obstetricians, doctors and other medical staff in the evening and at night. One study reported that only one junior doctor was available during evenings and nights to provide emergency obstetrics care in two public district hospitals.<sup>26</sup> Moreover, in the evening and at night, a lack of access to emergency care facilities, such as operating theatres and the unavailability of electricity, were factors, especially in public health-care settings located in semi-urban areas.<sup>27 28</sup> Such constraints had an impact on obstetricians' choice of

mode of delivery, in particular influencing them to perform more planned CS during the day shift.<sup>24 26-28</sup>

Our own CS is more or less elective CS because after office hours we do not have all manpower and facilities available. So, we try to do CS in the afternoon. Electricity is also a factor, so we try to do (CS in) daylight. We don't do it in the evening or night. (Obstetrician #3)<sup>27</sup>

Furthermore, anaesthesiologists were not available in the evening and at night.

We do not have enough anaesthetists. So, it has become a kind of official order that sirs (anaesthetists) are to inject anaesthesia only in the morning, not in the evening or at night. So, we do not have an operation theatre in the evening or at night. (Physician)<sup>28</sup>

#### Disrespectful obstetric care

Disrespectful obstetric care appeared as a key factor influencing women's decisions to choose elective CS. A woman living in a rural area who underwent a CS in a private setting described her reason,

She [clinician] did per vaginal examination several times, it was also much embarrassing and painful. I was losing my patience but they did not speak a single pleasant word to me. Then I left the hospital by giving 'risk bond' [discharge against medical advice] and went for caesarean section in a nearby clinic at 7 p.m. (Quote from post-caesarean mother)<sup>26</sup>

Several women from affluent families in urban areas shared their experiences of disrespectful labour care. For example, some urban women who had planned CS in the private sector stated they underwent the procedure without being fully informed about its benefits or risks.<sup>23</sup> Some rural women attending the public sector viewed the consent signing merely as a 'formality' as their healthcare providers did not inform them about CS indications.<sup>28</sup> Moreover, other women expressed fear about discussing their preferred delivery method with doctors.<sup>28</sup>

How could we (discuss our preferred mode of delivery)? Is it possible to tell the physician everything? Why didn't we tell? We were afraid; it's not possible to say so many things. (Patient 10)<sup>28</sup>

However, obstetricians in the public sector reported not having enough time to speak with patients or their family members (attendants) due to their heavy workload.

I have to see sixty patients daily. If I have to counsel attendants of every one of them, then I won't have time for doing operations.<sup>28</sup>

#### Private sector touting for CS

Junior doctors in rural public hospitals reported that private sector brokers and agents influence women and their families to leave public hospitals and opt for CS at nearby private hospitals. Moreover, obstetricians from rural public hospitals stated that some community healthcare providers (such as traditional

**Table 3** Proposed interventions

Potential interventions	Intervention strategies	Target stakeholders
Improve women's access to pain relief during labour	This could be improved by increasing anaesthetics training. Many African countries have invested in nurse anaesthetists who may also be able to advise regarding pain in labour. <sup>47 48</sup>	The healthcare system/healthcare providers
Promote evidence-based information around childbirth modes during antenatal care	Counselling on the benefits, risks and complications of different modes of childbirth should be included in the antenatal care plan and properly implemented. This is because the following topics are covered in the Birth preparedness section under the heading Health education, advice and counselling in antenatal care: place of delivery, attendants and blood donor, saving money and transportation	The healthcare system/healthcare providers
Promote informed consent	Introducing the consent form listing the pros and cons of a CS, where women need to sign or put a fingerprint saying that they have been informed of all pros and cons and understand them before surgeries take place	Healthcare providers
Monitor CS rates within and between healthcare facilities	In 2015, the WHO proposed the use of the Robson classification as a global standard for assessing, monitoring and comparing CS rates. <sup>49</sup> The key purpose of using this classification is to identify the characteristics of women and their babies with higher CS rates, highlighting key differences in obstetric practice between settings. In Bangladesh, only a few healthcare facilities have adopted the Robson Classification, according to the report of Training Manual on Robson Ten Group Classification System. <sup>50</sup> Adoption of this approach more widely will require training and resources to support implementation. The creation of digital dashboards and the benchmarking of performance between facilities could motivate uptake	The healthcare system/healthcare providers
Promote safe vaginal deliveries in rural areas	Increase maternity staff, particularly midwives, obstetricians and community-based skilled birth attendants in rural areas because about 35% of women across the country give birth at home mainly aided by TBAs, with higher proportions in rural areas	Healthcare system
Funding cut policy	Reduce funding for hospitals with high CS rates. This funding cut policy has been successful in Portugal, indicating a 14% reduction in CS rates in the public sector after implementing a policy of funding cuts for hospitals with CS rates above 30%. <sup>51</sup>	Public healthcare system
High tax policy	Impose a high tax on private hospitals with CS rates above a certain threshold. The proposed funding cut and high tax policy for facilities with high CS rates should be carefully considered because these strategies could have unintended consequences, such as facilities reducing obstetric services, possibly underreporting and misclassifying indications to avoid penalties	Private healthcare system

CS, caesarean section; TBA, traditional birth attendants.

birth attendants (TBA) or midwives) receive financial incentives for referring to the private sector. Women also noted that sometimes CS is done in the private sector unnecessarily due to financial motives.

In our hospital, there are many brokers. If CS is not done, they'll contact the patient's family to request for discharge to (a private) clinic. So, it is one of the important factors in decision in every place in Bangladesh. (MO #4)<sup>27</sup>

#### **THEME 4: KEY FINDINGS IN RELATION TO CULTURE (MACROSYSTEM): TRADITIONAL BIRTH ATTENDANTS (LOW CONFIDENCE)**

One key theme emerged within the culture—home births under TBA. Several rural women stated that

they had to undergo an emergency CS following critical complications during home childbirth assisted by TBA.<sup>26 28</sup> A woman who experienced a CS in the private sector said,

As a part of the tradition, I also went to my natal home and they called our family 'daima' [traditional birth attendant]. When labour pain started, my baby defecated inside the uterus and instantly she referred me to this hospital. Consequently, caesarean delivery saved my baby's life. (Post-caesarean mother)<sup>26</sup>

Another woman who experienced a CS in the public sector reported a similar experience.

We were bound to take the decision to have a CS. We wanted to have a normal delivery at home. We tried by the traditional birth attendant at home and it failed; we were afraid. (Emergency CS patient 15)<sup>28</sup>

## THEME 5: KEY FINDINGS RELATED TO TIME AND LIFE TRANSITIONS (CHRONOSYSTEM): CS EMERGED AS 'BETTER' (MODERATE CONFIDENCE)

One study explored the views of women's family members about CS.<sup>24</sup> The findings indicated that these family members preferred CS to vaginal births. They considered CS a better procedure, without pain or risk.

We are seeing this for 10–15 years. Nowadays, no family goes for normal delivery; everyone chooses Caesar. Over time either the baby or the mother faces problems in normal delivery; got older seeing these. And so, we did not delay anticipating that the baby and the mother would be fine after Caesar. (40-year-old husband)<sup>24</sup>

Like the husband, the mother-in-law presented similar views

Caesar has become very much normal these days, no more pain. Both the baby and pregnant women could live well.<sup>24</sup>

A rural pregnant woman who attended a focus group discussion said she would undergo a planned CS because she heard CS is better for babies' heads.

I prefer Caesarean delivery. I heard a baby delivered by caesarean section had a healthier brain. (Quote from a pregnant woman) (women's ages and number of children were not reported)<sup>26</sup>

## DISCUSSION

This study is the first systematic literature review identifying multi-level influences on the CS decision-making process in Bangladesh. Despite a limited number of studies (n=6), the findings were comprehensive from the perspectives of women and clinicians from the public and private sectors. Using meta-synthesis and the Bronfenbrenner ecological framework, we demonstrate several inter-connected factors at the level of the women factors—fear of childbirth; people's factors—friend and community influence; healthcare providers' factors—maternal request for CS, previous CS, lack of accountability and fear of litigation; healthcare system factors—lack of resources, disrespectful obstetric care and private agents touting for CS, cultural factors—TBA, and time and life transitions—CS emerged as 'better'.

We performed subgroup analyses to compare CS decision-making factors among private versus public, urban versus rural and wealthy versus impoverished backgrounds.

### Private versus public

The findings from the included studies indicate that most women underwent planned CS in private settings. CS rates in Bangladesh are significantly higher in for-profit private hospitals (80%) than in non-profit hospitals (35%), with financial incentives likely influencing this difference.<sup>29–32</sup> While the most recent data are not yet available, private hospitals in Bangladesh charge an

average of US\$276 for a CS, about five times the average that public hospitals charge, US\$45. According to Save the Children Bangladesh, women in Bangladesh paid about USD\$512 million for CS in 2018.<sup>33</sup>

In this review, we report that junior doctors working in public settings in semi-urban areas accused senior specialists of lacking accountability for their role in the rise in CS rates in Bangladesh; however, beyond these qualitative responses, we found limited corroborating evidence to support this claim. Pressure from senior doctors on junior staff to perform CS has been noted in other settings. A Tanzanian study revealed that senior clinicians often pressured junior doctors to perform CS without medical necessity; juniors claimed that senior specialists were 'uncomfortable with instrumental vaginal deliveries' and unable to teach them, leading to unnecessary CS.<sup>34</sup>

On the other hand, specialists in private settings in our review reported feeling unsupported by nurses in ensuring safe normal deliveries. Nursing education in Bangladesh includes midwifery content, but not at the level proposed by the International Confederation of Midwives.<sup>35</sup> Midwifery education in Bangladesh began in 2010. To date, only 8000 midwives have graduated, with 3000 employed in the public sector, particularly in rural areas.<sup>35</sup>

A key factor in the rise of daytime elective CS in the public sector is the shortage of obstetricians during evenings and nights, consistent with Panda *et al's* systematic review.<sup>36</sup> There is a critical shortage of healthcare professionals in Bangladesh. According to a Bangladesh Ministry of Health and Family Welfare report (2023), the nationwide vacancies of specialist doctors are 58%, junior doctors 25%, midwives 62% and nurses 10%.<sup>37</sup> Moreover, there is a shortage of essential drugs in public settings located in rural areas. According to a cross-sectional study conducted in 15 public settings in Northwestern Bangladesh, magnesium sulfate injections for treating severe pre-eclampsia and oxytocin, a uterotonic, were in 'stock-out' at nearly all surveyed facilities.<sup>38</sup>

The Government of Bangladesh is making continuous efforts to increase the number despite serious resource constraints. The plan to recruit another 5000 midwives is an example of this effort.<sup>39</sup> The introduction of trained midwives has rapidly improved the safety of childbirth by providing skilled birth attendants. By 2021, in 403 rural public health facilities, midwives accounted for 85% of total deliveries, up from 24% in 2018.<sup>35</sup> There is some evidence that the midwifery workforce has contributed to the reduction of maternal and newborn deaths and CS prevalence in those facilities.<sup>35</sup>

Unconsented frequent vaginal examinations in public-sector settings emerged as a factor influencing rural women's decisions about CS. Repeated or frequent vaginal examinations during labour are considered a 'harmful practice' in the Bangladesh National Guideline on Emergency Obstetric and Neonatal Care (EmONC).<sup>40</sup> In Bangladesh, there is evidence of disrespect in labour

care, for instance, 6% of women reported experiencing verbal abuse during childbirth,<sup>41</sup> 27% were not allowed to give birth in their preferred positions and 39% were denied the right to have a birth companion in health facilities.<sup>42</sup> In Bangladesh, it is generally not culturally accepted for men to be present in the delivery room, although there is no national law or policy that prohibits men from being present during childbirth.<sup>43</sup>

### Urban versus rural

A key finding across both rural and urban settings was the lack of family support for vaginal delivery, which strongly influenced the decision to undergo CS. This finding aligns with a recent cross-sectional study of 662 mothers in Jashore district, southwestern Bangladesh, conducted from 2022 to 2023.<sup>31</sup> The study found that women lacking family support were almost twice as likely to undergo CS as those with family support. Traditionally, pregnant women in Bangladesh have relied heavily on family support, and childbirth typically took place in women's homes with the help of close senior female family members, friends and neighbours. However, this review presents evidence that these attitudes are changing, with senior family members expressing a preference for CS. This finding aligns with a qualitative study conducted in Indonesia, a socio-cultural context similar to Bangladesh, which found that women's family members strongly prefer CS because they perceive it as an 'easy, less painful or riskless procedure'.<sup>44</sup>

### High versus low economic status

Our results indicate that women from wealthy families often plan elective CS very early in pregnancy, reflecting greater financial capacity, access to private facilities and perceived control over the mode of delivery. Conversely, women from low-income households are more likely to give birth at home with TBAs. According to BDHS 2022, about 35% of women across the country give birth at home without trained medical supervision,<sup>6</sup> with higher proportions in rural areas. Moreover, BDHS 2022 indicates a threefold difference in CS rates between rich (67%) and poor (20%) women, which underscores profound inequalities in access to and use of obstetric care.

### Limitations

Several limitations should be considered when interpreting our findings. First, despite systematic searches, we identified only six studies with qualitative data that included a small number of women, suggesting that some experiences, opinions and views may not be represented. Second, the findings may not fully represent the current burden of high CS in Bangladesh because the data were from public district hospitals and private clinics located in semi-urban areas, and most women were from low socioeconomic backgrounds. Third, this review's findings focus on decision-making for CS rather than decision-making for childbirth, including vaginal birth. Finally, some of the data presented in this review,

specifically the 2014 cost of CS, were outdated due to the absence of more recent publications. Despite these limitations, the strengths of this review include a broad search across many databases and websites and the use of the socio-ecological model, which aided in identifying multi-level factors influencing high CS rates. The inclusion of subgroup analysis of factors influencing CS across different settings and populations is also a major strength of this review.

### Implications

Our review indicates a need for more data on fear of childbirth, such as women's access to epidural analgesia during vaginal delivery, especially considering the severe shortage of physician anaesthesiologists—only 1000 nationwide.<sup>45</sup> Access to mobile epidurals and other forms of analgesia in labour is a crucial factor in dealing with women's fear. The findings from the included studies reveal that women and their family members perceive planned CS as safer than normal delivery. However, there is no evidence in the included studies that antenatal care providers provide accurate and evidence-based information about the risks and benefits of both CS and vaginal birth.

Antenatal care has significantly improved in the country; for instance, antenatal care coverage (at least one visit) has increased from 55% in 2011 to 88% in 2022, mostly in urban areas and among women from higher-income families, according to BDHS 2022. However, counselling on the risks and benefits of vaginal delivery versus CS and when CS is medically necessary is lacking in EmONC.<sup>40</sup>

It seems crucial to examine the key decision-makers within women's families, such as husbands, mothers-in-law and other senior relatives. This information underscores the importance of engaging key family decision-makers in antenatal counselling.

As noted in the introduction, the highest CS rate is 66% in Khulna and the lowest is 25% in the Sylhet division. However, the studies included in this review did not provide data from either of these divisions, highlighting an important gap in the evidence.

Moreover, the findings may not reflect the complexity of CS determinants in larger, more resource-intensive facilities, as the included studies used data from small clinics in semi-urban areas. It is advisable to examine data from larger institutions such as medical college hospitals, divisional hospitals and tertiary-level private hospitals.

We found no quantitative studies to explore the factors influencing decision-making for CS. This gap is critical, as there is no information on what proportion of women in the country undergo CS for specific reasons or factors in public and private settings, making it difficult for policymakers to determine which strategies will be most effective in terms of their investment.

Based on our review of the evidence, we recommend several interventions to promote optimal use of CS rates in Bangladesh and similar contexts (see [table 3](#)).

## CONCLUSIONS

There has been a significant increase in CS rates in Bangladesh over the last decade. Our meta-synthesis suggests that the decision to perform CS in Bangladesh is influenced by various factors related to women, their social networks, the healthcare providers and the healthcare system. We highlight how this information could inform policy analysis to promote the rational use of CS in Bangladesh. However, in a country with 3 million annual births (the 2023 crude birth rate was 20 per 1000 people),<sup>46</sup> there is an urgent need for large-scale quantitative studies using data from nationally representative sources, such as BDHS and the Health Management Information System to investigate both clinical and non-clinical factors leading to CS.

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## ORCID iDs

Mohammad Ali <https://orcid.org/0000-0001-9497-9472>

Jane E Hirst <https://orcid.org/0000-0002-0176-2651>

## REFERENCES

- Boerma T, Ronsmans C, Melesse DY, *et al*. Global epidemiology of use of and disparities in caesarean sections. *Lancet* 2018;392:1341–8.
- Betran AP, Ye J, Moller AB, *et al*. Trends and projections of caesarean section rates: global and regional estimates. *BMJ Glob Health* 2021;6:e005671.
- Betran AP, Torloni MR, Zhang J, *et al*. What is the optimal rate of caesarean section at population level? A systematic review of ecologic studies. *Reprod Health* 2015;12:57.
- World Health Organization. WHO statement on caesarean section rates. 2015. Available: <https://www.who.int/publications/i/item/WHO-RHR-15.02>
- Betran AP, Torloni MR, Zhang JJ, *et al*. WHO Statement on Caesarean Section Rates. *BJOG* 2016;123:667–70.
- National Institute of Population and Research Training. Bangladesh demographic and health survey 2022: key indicators report. 2022. Available: <https://dhsprogram.com/pubs/pdf/PR148/PR148.pdf>
- Boatin AA, Schlottheuber A, Betran AP, *et al*. Within country inequalities in caesarean section rates: observational study of 72 low and middle income countries. *BMJ* 2018;360:k55.
- World Health Organization. WHO recommendations non-clinical interventions to reduce unnecessary caesarean sections. 2018.
- Page MJ, McKenzie JE, Bossuyt PM, *et al*. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. 2021;74:790–9.
- Brown D. A Review of the PubMed PICO Tool: Using Evidence-Based Practice in Health Education. *Health Promot Pract* 2020;21:496–8.
- Hong QN, Pluye P, Fàbregues S, *et al*. Improving the content validity of the mixed methods appraisal tool: a modified e-Delphi study. *J Clin Epidemiol* 2019;111:49–59.
- Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;8:45.
- Jenabi E, Khazaei S, Bashirian S, *et al*. Reasons for elective cesarean section on maternal request: a systematic review. *J Matern Fetal Neonatal Med* 2020;33:3867–72.
- Johansson M, Alvan J, Pettersson A, *et al*. Conflicting attitudes between clinicians and women regarding maternal requested caesarean section: a qualitative evidence synthesis. *BMC Pregnancy Childbirth* 2023;23:210.
- Thirukumar P, Henry A, Coates D. Women's Experiences and Involvement in Decision-Making in Relation to Planned Cesarean Birth: An Interview Study. *J Perinat Educ* 2021;30:213–22.
- Bam V, Lomotey AY, Kusi-Amponsah Diji A, *et al*. Factors influencing decision-making to accept elective caesarean section: A descriptive cross-sectional study. *Heliyon* 2021;7:e07755.
- Coates D, Thirukumar P, Henry A. Women's experiences and satisfaction with having a cesarean birth: An integrative review. *Birth* 2020;47:169–82.
- Bronfenbrenner U. The ecology of human development. 1979.
- Corcoran J. Ecological factors associated with adolescent pregnancy: a review of the literature. *Adolescence* 1999;34:603–19.
- Hayes SW. Commentary: Deepening understanding of refugee children and adolescents using Bronfenbrenner's bioecological and PPCT models – A Commentary on Arakelyan and Ager (2020). *Child Psychology Psychiatry* 2021;62:510–3.
- Adibe B. COVID-19 and clinician wellbeing: challenges and opportunities. *Lancet Public Health* 2021;6:e141–2.
- Lewin S, Booth A, Glenton C, *et al*. Applying GRADE-CERQual to qualitative evidence synthesis findings: introduction to the series. *Implement Sci* 2018;13:2.
- Akhter S, Schech S. Choosing caesareans? The perceptions and experiences of childbirth among mothers from higher socio-economic households in Dhaka. *Health Care Women Int* 2018;39:1177–92.
- Sultana J, Sutradhar I, Rahman MJ, *et al*. An Uninformed Decision-Making Process for Cesarean Section: A Qualitative Exploratory Study among the Slum Residents of Dhaka City, Bangladesh. *Int J Environ Res Public Health* 2022;19:1465.
- Hairon A, Halim A, Abdullah ASM, *et al*. "I can't make it safe, so I don't do it": Exploring obstetricians' views on barriers and enablers to promoting vaginal birth after caesarean section in Bangladesh. *PLOS Glob Public Health* 2024;4:e0003963.
- Begum T, Ellis C, Sarker M, *et al*. A qualitative study to explore the attitudes of women and obstetricians towards caesarean delivery in rural Bangladesh. *BMC Pregnancy Childbirth* 2018;18:368.
- Aminu M, Utz B, Halim A, *et al*. Reasons for performing a caesarean section in public hospitals in rural Bangladesh. *BMC Pregnancy Childbirth* 2014;14.
- Doraiswamy S, Billah SM, Karim F, *et al*. Physician-patient communication in decision-making about Caesarean sections in eight district hospitals in Bangladesh: a mixed-method study. *Reprod Health* 2021;18:34.
- Tasnim Hossain A, Hazel EA, Rahman AE, *et al*. Effective multi-sectoral approach for rapid reduction in maternal and neonatal

- mortality: the exceptional case of Bangladesh. *BMJ Glob Health* 2024;9:e011407.
- 30 Ahmed A, Akter E, Sayeed A, *et al.* Factors influencing delivery-related complications and their consequences in hard-to-reach areas of Bangladesh. *Sex Reprod Healthc* 2024;40:100973.
  - 31 Hossain MS, Shuvo SD, Asha S, *et al.* Cesarean delivery and its determining factors: A hospital-based study in Jashore District, Bangladesh. *Public Health in Practice* 2024;8:100558.
  - 32 Begum T, Nababan H, Rahman A, *et al.* Monitoring caesarean births using the Robson ten group classification system: A cross-sectional survey of private for-profit facilities in urban Bangladesh. *PLoS One* 2019;14:e0220693.
  - 33 Save the Children. Bangladesh: 51% increase in “unnecessary c-sections” in two years. 2019. Available: <https://www.savethechildren.net/news/bangladesh-51-cent-increase-%E2%80%9D-c-sections-two-years>
  - 34 Litorp H, Mgaya A, Mbekenga CK, *et al.* Fear, blame and transparency: Obstetric caregivers’ rationales for high caesarean section rates in a low-resource setting. *Soc Sci Med* 2015;143:232–40.
  - 35 Anderson R, Williams A, Jess N, *et al.* The impact of professional midwives and mentoring on the quality and availability of maternity care in government sub-district hospitals in Bangladesh: a mixed-methods observational study. *BMC Pregnancy Childbirth* 2022;22:827.
  - 36 Panda S, Begley C, Daly D. Clinicians’ views of factors influencing decision-making for caesarean section: A systematic review and metasynthesis of qualitative, quantitative and mixed methods studies. *PLoS One* 2018;13:e0200941.
  - 37 Ministry of Health and Family Welfare. Bangladesh health workforce strategy. 2024.
  - 38 Billah SM, Chowdhury MAK, Khan ANS, *et al.* Quality of care during childbirth at public health facilities in Bangladesh: a cross-sectional study using WHO/UNICEF “Every Mother Every Newborn (EMEN)” standards. *BMJ Open Qual* 2019;8:e000596.
  - 39 Begum F, Ara R, Islam A, *et al.* Health System Strengthening Through Professional Midwives in Bangladesh: Best Practices, Challenges, and Successes. *Glob Health Sci Pract* 2023;11:e2300081.
  - 40 Obstetrical and Gynecological Society of Bangladesh. Standard clinical management protocols and flowcharts on emergency obstetric and neonatal care 2019. 2019. Available: <https://file-chittagong.portal.gov.bd/uploads/6b9a9df8-2650-4326-bbfd-55418d77e00d/66d/6ef/0b1/66d6ef0b196fa815778442.pdf>
  - 41 Manu A, Zaka N, Bianchessi C, *et al.* Respectful maternity care delivered within health facilities in Bangladesh, Ghana and Tanzania: a cross-sectional assessment preceding a quality improvement intervention. *BMJ Open* 2021;11:e039616.
  - 42 Perkins J, Rahman AE, Mhajabin S, *et al.* Humanised childbirth: the status of emotional support of women in rural Bangladesh. *Sex Reprod Health Matters* 2019;27:1610277.
  - 43 Zakaria M, Khan AKMZR, Ahmad MS, *et al.* Women’s Perception of Male Involvement in Antenatal, Childbirth and Postnatal Care in Urban Slum Areas in Bangladesh: A Community-Based Cross-Sectional Study. *Healthcare (Basel)* 2021;9:473.
  - 44 Zahroh RI, Hazfiarini A, Martiningtyas MA, *et al.* Rising caesarean section rates and factors affecting women’s decision-making about mode of birth in Indonesia: a longitudinal qualitative study. *BMJ Glob Health* 2024;9:e014602.
  - 45 Meadows JW, Al Imran TMT, LeBrun DG, *et al.* Anesthesia Infrastructure and Resources in Bangladesh. *Anesth Analg* 2020;130:233–9.
  - 46 World Bank. Birth rate, crude (per 1,000 people). 2026. Available: <https://genderdata.worldbank.org/en/indicator/sp-dyn-cbrt-in>
  - 47 Edgcombe H, Baxter LS, Kudsk-Iversen S, *et al.* Training non-physician anaesthetists in sub-Saharan Africa: a qualitative investigation of providers’ perspectives. *BMJ Open* 2019;9:e026218.
  - 48 Holtzhausen JD, Downing C, Poggenpoel M, *et al.* The development and evaluation of a nurse anaesthesia model for practice in South Africa. *Int J Nurs Sci* 2022;9:334–42.
  - 49 World Health Organization. Robson classification: implementation manual. 2017.
  - 50 Ministry of Health and Family Welfare. Training manual on robson ten group classification system: maternal health program directorate general of health services, ministry of health and family welfare. 2022. Available: <https://resourcecentre.savethechildren.net/pdf/Training-Manual-on-ROBSON-Ten-Group-Classification-System.pdf>
  - 51 Ayres-De-Campos D, Cruz J, Medeiros-Borges C, *et al.* Lowered national cesarean section rates after a concerted action. *Acta Obstet Gynecol Scand* 2015;94:391–8.