



A Systematic Review of Factors Influencing
Utilization of Maternal Health Services in
Bangladesh

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Abstract

Maternal health remains a pressing public health priority in Bangladesh, where despite significant progress in reducing maternal mortality, inequities in healthcare utilization continue to undermine outcomes. This systematic review critically examines the determinants of maternal healthcare service use antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC) drawing on 17 empirical studies published between 2015 and 2025. Studies were identified through searches of APA PsycINFO, EBSCOhost, MEDLINE, as well as CINAHL, screened using PRISMA 2020 guidelines, and appraised with the Joanna Briggs Institute (JBI) tools.

Findings reveal a dual set of enablers and barriers shaping service utilization. Positive factors included maternal and spousal education, higher household wealth, urban residence, media exposure, male involvement, and community outreach, alongside health system readiness. In contrast, poverty, rural and coastal residence, limited autonomy, entrenched cultural norms, inadequate facility capacity, and disaster vulnerability consistently hindered access. Across studies, ANC uptake ranged from 25% to 51%, SBA from 21% to 53%, and PNC within 48 hours remained below 40%.

The review underscores the need for integrated strategies combining health system strengthening, women's empowerment, and targeted interventions for vulnerable groups. These insights provide an evidence base to guide Bangladesh toward achieving Sustainable Development Goal 3.1 by 2030.

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LIST OF ABBREVIATIONS

Abbreviation Full Form

ANC	Antenatal Care
SBA	Skilled Birth Attendance / Skilled Birth Attendant
PNC	Postnatal Care
MHS	Maternal Health Services
MHC	Maternal Healthcare
BDHS	Bangladesh Demographic and Health Survey
BMICS	Bangladesh Multiple Indicator Cluster Survey
BAHWS	Bangladesh Adolescent Health and Wellbeing Survey
DHS	Demographic and Health Survey
WHO	World Health Organization
UNICEF	United Nations International Children's Emergency Fund
MoHFW	Ministry of Health and Family Welfare (Bangladesh)
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
JBIC	Joanna Briggs Institute
mHealth	Mobile Health
SDG	Sustainable Development Goals
RCT	Randomized Controlled Trial
OR	Odds Ratio

Abbreviation Full Form

AOR	Adjusted Odds Ratio
CI	Confidence Interval
FBD	Facility-Based Delivery
CHW	Community Health Worker
TT	Tetanus Toxoid
IFA	Iron and Folic Acid
FGDs	Focus Group Discussions
IDIs	In-Depth Interviews
KIIs	Key Informant Interviews
RMNCH-N	Reproductive, Maternal, Neonatal, Child Health and Nutrition

CHAPTER 1

INTRODUCTION

1.1 Background

Maternal health remains one of the most pressing global health priorities and a key indicator of equity, social development, and health system performance (Jolivet et al., 2025). Despite decades of investment, maternal mortality remains unacceptably high, with approximately 287,000 women dying worldwide in 2020 due to largely preventable causes related to pregnancy and childbirth (WHO, 2023). Almost 95% of these deaths occurred in low- and middle-income countries (LMICs), underscoring the entrenched disparities between high-income and resource-constrained settings (Bartlett et al., 2023). Global commitments, particularly the Sustainable Development Goal (SDG) 3.1, aim to reduce the maternal mortality ratio (MMR) to fewer than 70 deaths per 100,000 live births by 2030. However, progress remains uneven, with many LMICs—especially in Sub-Saharan Africa and South Asia—still facing systemic and structural barriers to achieving these targets (Dhar et al., 2025).

In South Asia, maternal health still represents persistent disparities in access and use of health care (Aftab et al., 2025). The region contributes to almost one-third of all deaths in childbirth, even though it has made enormous progress in the last 30 years (WHO, 2022). India had its MMR at 556 in 1990 and 103 in 2020, and Nepal had its 553 to 186 in the same years (World Bank, 2022). But like other countries in the region, both countries are still struggling to provide universal access to basic maternal health services, such as antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC). The rural-urban disparities, deep-rooted gender structures, and socio-economic differences are of primary concern to safe motherhood in South Asia (Specialpedagogik, 2025). The context of the region helps in giving a comparative analysis of the progress and the challenges that Bangladesh is facing.

Bangladesh has also achieved great steps towards maternal health outcomes, which can be considered one of the success stories in this region. The MMR in the country dropped to 115 per 100,000 live births in 2023, compared to 574 in 1990, reflecting an 80 percent decrease (UNICEF, 2023). This has been made possible by the community-based programmes, increases in the number of trained birth attendants, and investments in emergency birth attendants. However, even with this, the maternal mortality is still far above the SDG 3.1

target of 70, indicating that Bangladesh still has much work to do to achieve global targets. Additionally, maternal morbidity, such as obstetric fistula, anaemia, and persistent reproductive health issues, has still been skewed against marginalised women (Osakwe, 2021).

Maternal healthcare services usage is a key determinant of maternal outcomes, but evidence shows that there are still gaps in Bangladesh. The Bangladesh Demographic and Health Survey (BDHS) 2017–18 notes that just 25 per cent of women received at least four ANC visits, which is a substantially high percentage compared to 13 per cent in 2012 but remains far short of the WHO-suggested level (Islam & Masud, 2018). Likewise, the percentage of SBA coverage rose in the period between 2007 and 2017/18 (53 and 21, respectively). However, the PNC is the least used, as few women obtain care within 48 hours of childbirth, the deadline during which maternal and neonatal mortalities can be prevented (NIPORT et al., 2020). These numbers reflect a twofold story: significant improvements in service uptake, but with inadequate coverage to make maternal health protection equitable and universal.

More importantly, inequalities in usage represent structural inequalities. Compared to rural women, urban women are far more prone to SBA, and its coverage is 68 per cent among urban women (Alam et al., 2022). Income inequalities are also quite pronounced, and women in the richest quintile are twice as likely to use ANC services and SBA as the poorest households (WHO, 2023; Holden, 2023). It turns out that education is one of the most significant factors influencing service uptake: women with secondary or higher education face a significantly higher likelihood of engaging in ANC visits and childbirth in a facility, and women with no education are at the highest risk (Kumatso, 2025). The findings indicate that advancement in maternal health is highly correlated with the overall socioeconomic development, gender equality, and educational levels.

In addition to socioeconomic differences, cultural and gender norms have a significant influence on maternal healthcare use. Women will still face barriers to timely access to care in conservative rural communities because of their limited autonomy, limited mobility, and dependence on husbands or elders when making decisions about their health (Geremew et al., 2025). These dynamics are similar to trends in South Asia, where it is a patriarchal system that continues to be a primary factor influencing health-seeking behaviour (Chaturvedi et al., 2025). These structural inequalities interact with these cultural barriers, increasing inequity within marginalised populations.

The health system in Bangladesh is itself a demonstration of systemic weaknesses that contribute to more severe maternal health inequities. Government health spending is still at 2.4% of GDP, one of the lowest in the world, and three-quarters of total health expenditure comes at the cost of household out-of-pocket spending (World Bank, 2022; Lalthapersad-Pillay, 2021). The impact of this financial burden is not distributed evenly, and low-income families are more likely to suffer at its hands, as they might end up postponing or missing out on necessary maternal healthcare. Moreover, in rural locations, the quality and continuity of care are adversely impacted by chronic shortages of skilled personnel, essential medicines, and diagnostic services (Adhikari et al., 2024). Geographic barriers further contribute to the exclusion, with communities in remote Char (riverine islands) and Haor (wetlands) regions and disaster-prone coastal belts continuing to have no, or slow, physical access to timely and quality maternal health care. Climate change-related effects such as flooding and salinity intrusion also contribute to these geographic vulnerabilities by limiting access to healthcare facilities (Anik et al., 2023).

1.2 Rationale of the Study

Although incredible gains have been achieved to date in ensuring that maternal mortality has been averted in the last thirty years, Bangladesh has still been plagued by unresolved inequalities as far as maternal healthcare uptake is concerned. According to national statistics, 25% of women received at least four antenatal care (ANC) visits, 53% of women received skilled birth attendance (SBA), and less than 40% of women received timely postnatal care (PNC) (NIPORT et al., 2020). These averages obscure pronounced disparities: urban SBA coverage is at 68%, and rural coverage is at 52% (Alam et al., 2022). Likewise, wealthier households are at least two and one-half times more likely to utilise ANC and SBA services than women in the poorest quintile (WHO, 2023). Such inequities still exist, indicating that Bangladesh has not been progressing equally, with vulnerable women, especially rural, coastal, and marginalised ones, remaining disproportionately exposed.

These disparities are significant because of structural barriers. Health facilities in rural or disaster-prone areas may be limited, and their access can be further hindered by climate-related issues, like flooding or cyclones (Alam et al., 2022; Hossain et al., 2024). Maternal health service use is limited in urban slums due to the overcrowding of slums, the dominance of informal providers, and a lack of awareness (Mistry et al., 2021; McNab et al., 2022). These structural barriers are heightened by the norms of culture and gender. Most women

lack the autonomy to make healthcare decisions, and they rely on their husbands or the older generation to grant them permission to seek care, often delaying or denying them the opportunity to access care on time (Geremew et al., 2025). These barriers have exposed maternal healthcare access as being influenced by service availability as well as profoundly ingrained social and cultural processes.

The current literature has identified these determinants, albeit in a perfunctory manner. Other studies highlight individual drivers of change like education or income, whereas others concentrate solely on supply-side issues such as workforce shortages or facility preparedness (Chaturvedi et al., 2025). The intersection of these demand- and supply-side factors is very infrequently studied, which is important in the context of the complexity of maternal health utilisation (Cheruto, 2021). Moreover, the evidence is spread out across study designs with little integration to derive a coherent national policy. This fractured literature base limits policymakers, who might be tempted to look for piecemeal solutions to the multi-dimensional nature of barriers, which could include, but not be limited to, the use of financial subsidies, awareness campaigns, or digital health initiatives (Hollimon et al., 2025; Abreh et al., 2025). Such highly focused policies in a resource-constrained situation such as Bangladesh can easily become ineffective, unsustainable, or poorly suited to the realities of women.

To fill in these evidence gaps, this review will synthesise empirical research on maternal healthcare utilisation in Bangladesh published in the last five years (2015-25). It integrates results from 17 studies by other researchers into a single consistent body of evidence that combines findings of quantitative, qualitative, quasi-experimental, and mixed-method designs. Unlike fragmented single-focus studies, this review examines a wide range of determinants, including socioeconomic status, education, cultural and gender norms, geographic barriers, and health system readiness, offering a holistic understanding of both enablers and barriers to ANC, SBA, and PNC use.

The rationale for this review rests on three pillars. First, comprehensiveness: synthesizing evidence across designs and populations enables a more nuanced picture of maternal healthcare utilization than any single study can provide. Second, policy relevance: Bangladesh stands at a critical juncture as it strives to meet SDG 3.1, which targets reducing the maternal mortality ratio to fewer than 70 per 100,000 live births by 2030. Achieving this requires policies grounded in integrated, context-specific evidence, especially for underserved groups. Third, rigor and transparency: this review follows the PRISMA 2020

guidelines (Page et al., 2021) and applies the JBI critical appraisal tools for quality assessment, ensuring reliability and methodological consistency.

Importantly, the review pays special attention to vulnerable and marginalized groups that are often overlooked in national surveys and policy planning. Women living in disaster-prone coastal belts face barriers such as salinity intrusion, flooding, and facility inaccessibility, which exacerbate health risks and limit service use (Hossain et al., 2024). Urban slum residents, on the other hand, often rely on unregulated private or informal providers, highlighting the need for stronger oversight and community-based interventions (Mistry et al., 2021). Adolescents and first-time mothers, who often lack knowledge, autonomy, and financial resources, represent another under-researched group requiring tailored interventions (Geremew et al., 2025). By including studies that address these populations, this review contributes evidence that is both nationally relevant and crucial for advancing health equity.

1.3 Aim, Objectives, and Research Questions

Aim

To systematically review the factors influencing (both negative/positive or barriers and facilitators) the utilization of maternal healthcare services (ANC, SBA, and PNC) among Bangladeshi women of reproductive age.

Objectives

- i. To examine the negatively influencing factors (barriers) affecting maternal health service utilization in Bangladesh.
- ii. To assess the positively influencing factors (facilitators) affecting maternal health service utilization in Bangladesh.
- iii. To consolidate and synthesize existing empirical evidence to inform future policy and programmatic interventions aimed at improving equitable access to maternal healthcare services.

Research Questions

What factors facilitate maternal healthcare utilization in Bangladesh, and what barriers continue to hinder women from accessing these essential services?

CHAPTER 2

METHODOLOGY

2.1. Study Design

This review adopted a **systematic review (SR) design**, considered the gold standard in evidence synthesis because it minimizes bias, ensures replicability, and enables transparent reporting of methods and findings (Page et al., 2021). A systematic review was particularly appropriate given the wide range of studies published on maternal healthcare utilization in Bangladesh, which span community-based surveys, nationally representative demographic health surveys, qualitative explorations, and mixed-method studies. Conducting a new primary study would have added limited value; instead, systematically consolidating existing knowledge allows for the identification of recurring determinants, contradictions across contexts, and areas where evidence remains weak or absent.

The review sought to go beyond description to offer a **critical synthesis** of findings. Quantitative studies were valued for their ability to measure prevalence, associations, and predictors of healthcare utilization, often using large nationally representative samples such as the Bangladesh Demographic and Health Survey (BDHS). At the same time, qualitative and mixed-methods evidence was considered essential for uncovering cultural, gendered, and structural dynamics often missed in survey data. This integration of methodological traditions reflects the recognition in public health that complex behaviors such as healthcare utilization cannot be understood from a single evidence stream (Hanckel et al., 2021).

2.2 Research Framework

The review was structured using the **PEO framework (Population, Exposure, Outcome)**, which is widely applied in public health reviews where the goal is to understand determinants rather than evaluate interventions (Bettany-Saltikov & McSherry, 2016). The **population** of interest was defined as women of reproductive age (15–49 years) in Bangladesh, regardless of parity or socioeconomic status. The **exposures** of interest included socioeconomic factors (education, income, household head's literacy), geographic and infrastructural factors (urban/rural residence, disaster-prone locations, distance to facility), and cultural and gendered influences (autonomy, decision-making power, beliefs around pregnancy). The **outcomes** examined were utilization of key maternal health services: antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC).

PEO was chosen instead of PICO because the review did not focus on the effectiveness of specific clinical interventions but rather on **patterns of utilization** and barriers across contexts. This framework enabled the incorporation of more diverse evidence, such as cross-sectional surveys, qualitative research, and explanatory mixed-method designs, as the issue of maternal healthcare access is multifaceted.

2.3 Databases and Search Strategy

A rigorous and extensive search policy was utilised to find research on factors that affect the utilisation of maternal healthcare in Bangladesh. This was aimed at making sure that a wide scope of appropriate peer reviews and grey literature was taken into account and that it represented different study designs and approaches. The strategy was organised as a process and was guided by the PRISMA 2020 guidelines to maintain transparency, replicability, and comprehensiveness (Page et al., 2021).

2.3.1 Electronic Databases

The literature search covered three major academic databases, so a systematic search strategy was developed in order to cover the relevant literature as completely as possible. The MEDLINE, APA PsycINFO, CINAHL, and Scopus databases were searched since all of them include biomedical, psychological, nursing, and multidisciplinary studies related to the maternal health issue. Moreover, institutional sources such as the World Health Organisation (WHO), UNICEF, and the Ministry of Health and Family Welfare (MoHFW), Bangladesh, were also searched to retrieve reports, appraisals, and policy documents that may not be listed in peer-reviewed journals.

Search Parameters & Keywords

The search was limited to **English-language publications between 2015 and 2025**, aligning with the Sustainable Development Goal (SDG) era and contemporary policy reforms in Bangladesh. Boolean operators, truncations, and MeSH terms were used to capture variations in terminology. For example, one MEDLINE search string was: (*“maternal healthcare services” OR “antenatal care” OR “skilled birth attendance” OR “postnatal care”*) AND (*“Bangladesh”*) AND (*“determinants” OR “utilization” OR “barriers”*).

Table 2.1: Search terms and keywords based on the PEO Framework

PEO Element	Search Terms/keywords
Population	“women”, “female”, “mothers”, “reproductive age”, “pregnant women”, “Bangladesh”
Exposure	“barriers”, “determinants”, “wealth index”, “accessibility”, “influencing factors”, “facilitators”, “socioeconomic factors”, “education”, “decision-making”, “cultural norms”, “gender roles”, “access to health services”, “healthcare availability”
Outcome	“maternal health services”, “antenatal care”, “postnatal care”, “skilled birth attendance”, “institutional delivery”, “service utilization”, “healthcare utilization”, “utilization of maternal health services”

Search Management and Screening

All retrieved records were imported into **Rayyan**, an online review management tool, to facilitate blinded screening and reduce bias. Screening was conducted in two phases: title and abstract screening followed by full-text eligibility assessment. Duplicates were removed before screening. Studies were included if they (1) examined factors influencing maternal healthcare utilization in Bangladesh, (2) reported primary data from women of reproductive age or health providers, and (3) were published between 2015 and 2025. Exclusion criteria included studies not conducted in Bangladesh, editorials, and those focusing exclusively on neonatal outcomes without reference to maternal healthcare.

To ensure methodological rigor, **critical appraisal tools** from the Joanna Briggs Institute (JBI) were applied to assess the quality of included studies, tailored to each design (cross-sectional, qualitative, or mixed-method). This allowed the synthesis to account for potential biases in individual studies rather than treating all evidence as equal in weight.

2.4 Inclusion and Exclusion Criteria

To maintain a focused and methodologically sound review, strict inclusion and exclusion criteria were applied. The aim was to select studies that provide primary, empirical evidence

on the utilization of maternal health services in Bangladesh, while filtering out those that do not directly contribute to this objective (Table 2.2)

Table 2.2: Inclusion and Exclusion Criteria with Justification

Criterion	Inclusion	Exclusion	Justification
Study Population	Studies that focus on women of reproductive age (15–49 years) residing in Bangladesh.	Studies that involve populations outside Bangladesh or women not within the reproductive age range.	To ensure that the evidence directly relates to the target population most relevant to maternal healthcare use.
Geographic Focus	Research conducted specifically in Bangladesh or using Bangladesh-specific disaggregated data.	Studies conducted in other countries or global/regional analyses that do not isolate Bangladeshi data.	To maintain the national relevance of findings in the context of Bangladesh's healthcare system.
Exposure Factors	Studies that examine influencing factors such as income, education, gender roles, autonomy, geographic barriers, transportation, health system access, or use of digital tools.	Studies that do not address specific determinants influencing maternal healthcare service utilization.	To ensure alignment with the review's aim of identifying barriers and facilitators to maternal health access.
Health Outcomes	Studies that assess the utilization of maternal health services, including antenatal care (ANC), skilled birth attendance (SBA), and postnatal care	Studies that focus only on child health, neonatal outcomes, or maternal morbidity without measuring service utilization.	To ensure consistency with the review's outcome indicators focused on service uptake.

	(PNC).		
Study Type	Primary empirical studies using qualitative, quantitative, or mixed-methods approaches.	Systematic reviews, scoping reviews, meta-analyses, editorial pieces, commentaries, and study protocols.	To include original research only, avoiding duplication and ensuring methodological diversity.
Publication Type	Peer-reviewed journal articles and full institutional reports with clear methodology sections.	Grey literature lacks methodological details, conference abstracts, and unpublished theses.	To ensure the inclusion of high-quality, verifiable, and methodologically sound sources.
Time Frame	Studies published between January 2015 and May 2025.	Studies published prior to January 2015.	To capture evidence aligned with recent maternal health policy shifts and SDG-era targets.
Language	Studies published in English.	Studies published in any language other than English.	Due to limitations in language proficiency and to ensure consistency in interpretation and critical appraisal.

This rigorous inclusion-exclusion filter was used to ensure that the ultimate selection of studies represented real-world maternal health experiences and was based on sound empirical techniques. It also served as a good base to establish patterns, gaps, and actionable insights in the provision of maternal healthcare in Bangladesh.

2.5 Screening and Selection Process

Systematic review search and filtering. The search and selection of studies was carried out in a structured and step-by-step manner, assisted by Rayyan, a web-based tool created specifically to facilitate systematic reviews. This made the entire process transparent, reproducible, and in compliance with the PRISMA 2020 guidelines (Page et al., 2021). This was done in four primary steps: importation of references, screening of titles and abstracts, full text screening, and data extraction.

Initially, all the sources identified during database searches and grey literature sources were added to Rayyan. To eliminate the unnecessary records, the duplicate detection algorithm incorporated in the platform was utilised to recognise and delete the unwanted records. To facilitate the verification process of the data, this was done manually, as duplicate detection software is not perfect. This measure avoided excess representation of studies as well as bias in further screening.

Second, title and abstract screening were carried out using predefined inclusion and exclusion criteria. Studies were excluded if they were irrelevant to the research question—for example, systematic reviews, meta-analyses, commentaries, animal studies, or clinical trials. This stage served to filter out studies that clearly did not meet eligibility criteria, while retaining those that warranted closer examination.

Third, a full-text review was performed for all remaining studies. Each article was read in detail to verify eligibility based on population (women of reproductive age in Bangladesh), exposure (socioeconomic, cultural, or health system factors), outcomes (antenatal care, skilled birth attendance, or postnatal care), and study design (quantitative, qualitative, or mixed-methods). At this stage, **reasons for exclusion were systematically documented** (e.g., wrong population, insufficient methodological detail, or irrelevant outcomes), which is essential for transparency and will be displayed in the PRISMA flow diagram in Chapter 3.

Finally, data extraction was initiated for studies that passed full-text screening. Although this step formally belongs to the synthesis stage, piloting of data extraction during screening ensured consistency in variable definitions and reduced errors. This early integration of extraction with screening helped refine the inclusion criteria and provided confidence that only relevant, high-quality evidence was carried forward.

2.6 Data Extraction

Data extraction for this review was carried out systematically using a structured template developed in Microsoft Excel. The form was adapted from guidance in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins et al., 2022) and tailored to reflect the objectives of the current study, which focused on identifying determinants of maternal healthcare utilization in Bangladesh. The structured form was designed to capture methodological, contextual, and outcome-related information in a standardized way, ensuring comparability across diverse study designs.

2.7 Quality Assessment

To evaluate the robustness of the evidence base, all included studies were subjected to critical appraisal using the **Joanna Briggs Institute (JBI) critical appraisal tools**, applied according to study design. Cross-sectional studies were appraised using the JBI Analytical Cross-Sectional Checklist, the single qualitative study using the JBI Qualitative Checklist, and the one mixed-methods study was assessed by combining criteria from both relevant tools. This structured process enabled a consistent evaluation of methodological strengths and weaknesses across a diverse body of literature.

The appraisal considered multiple dimensions of methodological quality, including the clarity of inclusion criteria, adequacy of population and setting descriptions, validity and reliability of exposure and outcome measures, identification and management of confounding factors, appropriateness of statistical analysis, and—where applicable—congruity between philosophical perspective, methodology, and interpretation. Each checklist item was scored *Yes*, *No*, or *Unclear*, with overall scores converted into categorical quality ratings: **High (7–8/8 for cross-sectional; $\geq 8/10$ for qualitative), Moderate (5–6/8), and Low ($\leq 4/8$).**

Of the **15 cross-sectional studies**, appraisal scores ranged from **5/8 to 8/8**. Ten studies achieved **high-quality ratings** (scoring 7–8/8), reflecting robust inclusion criteria, reliable measurement of exposures and outcomes, and appropriate use of statistical techniques. These included nationally representative analyses using DHS and MICS data, which benefited from large sample sizes and established methodologies. However, five studies scored in the **moderate range (5–6/8)**, largely due to limited adjustment for confounding factors, lack of justification for sampling approaches, or reliance on self-reported measures without validation. None of the cross-sectional studies fell into the low-quality category, suggesting an overall strong body of quantitative evidence.

The **single qualitative study** (Shah et al., 2020) was scored against ten criteria and achieved **8/10**, placing it within the **high-quality category**. The study demonstrated strong methodological congruity, clear representation of participant voices, and coherent interpretation of results. However, it was limited by the absence of explicit reflexivity; the researchers did not sufficiently address how their positionality may have influenced data collection and analysis.

The **mixed-methods study** (Chowdhury et al., 2022) received a **moderate-quality rating**, as while the quantitative component (scoring 6/8) demonstrated methodological rigor in survey design and data analysis, while the qualitative strand was less robust, with insufficient detail on analytic procedures and integration of qualitative insights into the overall findings.

Various weaknesses were found throughout the dataset. Most studies focused poorly on confounding factors, and frequently, they recognised the presence of confounding factors but did not fully control them using statistical computations. Dependence on self-administered healthcare utilisation data was prevalent, and this creates issues of recall bias and accuracy. Additionally, smaller community-based studies often lacked a clear justification of sampling strategies, which can influence the representativeness of their results. In the qualitative world, constraints were also identified concerning reflexivity and researcher influence that were seldom addressed directly.

2.8 Data Synthesis

Due to the heterogeneity of the study designs, data-gathering instruments, and the measured results, a narrative synthesis method was chosen. In this way, it became possible to combine the results of quantitative and qualitative research and ensure the complexity and richness of the data are preserved. All studies were thoroughly read and thematically coded based on the main dimensions of using antenatal care, access to facilities, education, wealth index, and cultural beliefs (Nisha et al., 2021). These themes were then clustered together to determine commonalities, deviations, and gaps.

The synthesis process was iterative and involved cross-comparing themes between studies conducted in urban versus rural settings, or across different socioeconomic groups. Special attention was paid to context-specific insights, such as the influence of disaster-prone environments or digital health tools (Nielsen et al., 2024). Where discrepancies emerged,

such as differences in service uptake or measurement tools they were noted and interpreted in light of methodological or contextual differences.

2.9 Ethical Considerations

This systematic review did not involve any new data collection or interaction with human subjects. As such, it did not require formal ethical approval. All data sources used in this study journal articles, health surveys, and institutional reports were publicly available and accessed via academic databases or organizational websites (Musarandega et al., 2021).

Nevertheless, the review was conducted with full adherence to principles of academic integrity. All sources were accurately cited, and efforts were made to represent findings objectively and transparently. By including both high- and low-quality studies and acknowledging their limitations, the review also mitigated potential publication bias, allowing for a more balanced synthesis.

CHAPTER 3

RESULT

3.1 PRISMA Findings

The database search yielded a total of 2,939 records published between 2015 and 2025. These were imported into Rayyan, a web-based tool designed to facilitate systematic review screening. An automated duplication check in Rayyan initially identified 920 potential duplicates. After careful review, 467 were confirmed and deleted, while the remaining flagged records were manually resolved as non-duplicates. This process left a total of 2,472 unique records for title and abstract screening.

The initial screening phase involved a title and abstract review, guided by predefined inclusion and exclusion criteria. Studies were excluded if they were systematic reviews, meta-analyses, editorials, trials, non-empirical papers, or focused on animal models. A total of 2,445 records were excluded at this stage, with the following primary reasons:

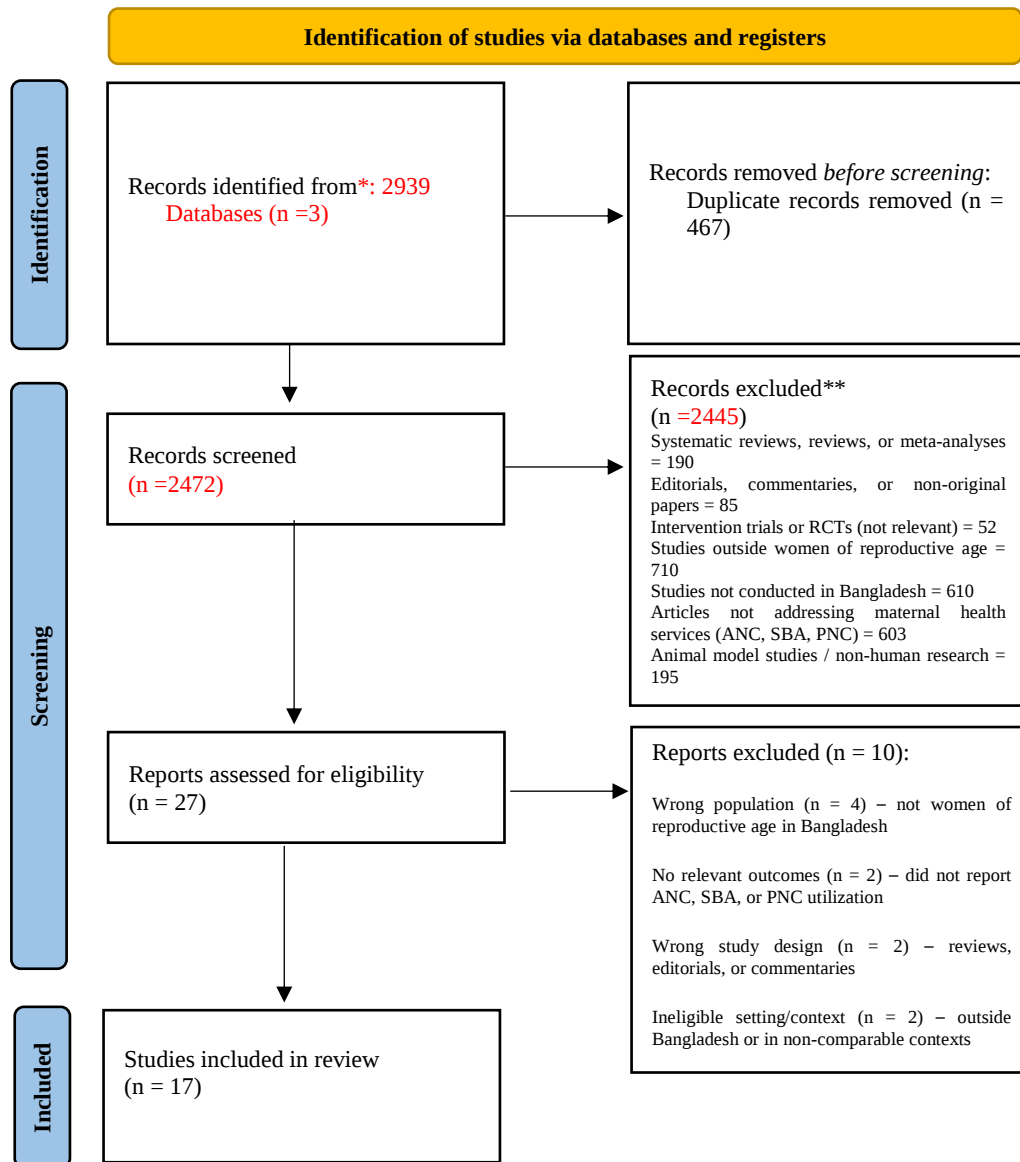


Figure 1: PRISMA Flow Chart

3.2 Study Characteristics

This systematic review synthesizes evidence from **17 peer-reviewed empirical studies** published between 2015 and 2025, all focused on maternal healthcare utilization in Bangladesh. The studies collectively explored factors influencing the uptake of antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC), applying a range of methodological approaches. Eligibility required that studies involve women of reproductive age (15–49 years), use empirical data, and investigate socioeconomic, geographic, cultural, or structural determinants of maternal healthcare use.

The majority of studies (**n = 15**) employed **cross-sectional quantitative designs**. Several were based on nationally representative datasets such as the Demographic and Health Survey (BDHS) or Multiple Indicator Cluster Survey (MICS), including Kabir et al. (2021), Khan et al. (2020), Chanda et al. (2020), Billah et al. (2022), Rahman et al. (2024), and Alam et al. (2025). Such studies used logistic regression or other similar analytical tools to test the relationship between maternal service uptake and education level, household wealth, and geographical inequalities. Community-based cross-sectional studies included Akter (2022), Farah and Karim (2015), Ali et al. (2018), Nizum et al. (2023), and Al-Mamun et al. (2025), which adopted smaller but contextually relevant populations in rural or coastal areas. Mistry et al. (2021) specifically studied urban slum populations, Begum and Hamid (2023) compared areas with disasters and those without disasters, and Gopalan et al. (2021) used machine learning on DHS and facility data to determine areas of priority investment. These combined studies provided both scope in the form of large-scale surveys and focus in localised studies.

A qualitative design was used in one study: Shah et al. (2020) utilised focus group discussions and in-depth interviews in rural Bangladesh to investigate the barriers to emergency maternal care using the Three Delays Model. This publication helped shed light on the reality of care seeking and identified those variables that are under-represented in the survey data, like recognising symptoms, making decisions based on gender, and health worker shortage.

A mixed-method study was applied directly in only one study: Chowdhury et al. (2022) used mixed-method surveys and qualitative interviews in geographically inaccessible regions and

analysed them using the Tanahashi framework. This study offered a multidimensional perspective of bottlenecks in the healthcare delivery of maternal and newborn health services by considering the household, facility, and stakeholder perspectives.

Some of the sample sizes were very small (qualitative cohorts were used, $n = 59$ participants in FGDs, Shah et al., 2020); others were very large (national datasets in the range of 5,000 women and more, Kabir et al., 2021). The majority of the studies focused on women between 15 and 49 years old with recent deliveries, but some covered more inclusive categories such as household heads (Rahman et al., 2024) or healthcare providers (Billah et al., 2022; Chowdhury et al., 2022).

In the studies, maternal health outcome was determined using indicators that included the number and timing of ANC visits, uptake of SBA, institutional delivery, receiving iron and folic acid supplements, tetanus vaccines, and PNC within 24 hours. Such determinants were women's education, income and wealth index, spousal occupation and support, decision-making autonomy, media exposure, cultural beliefs, and accessibility geographically (Ali et al., 2018; Kabir et al., 2021; Al-Mamun et al., 2025).

Studies on the subject were conducted across extensive geographical areas, including urban and rural centres (Dhaka (Mistry et al., 2021)), rural communities (Patuakhali/Khulna (Farah and Karim, 2015; Akter, 2022)) and calamity-prone regions (Begum and Hamid, 2023)), as well as coastal and hard-to-reach locations (e.g., chars, haors, and hill tracts (Chowdhury et al., 2020)). This diversity enhanced the evidence base by demonstrating the difference in the extent of maternal healthcare use with varying socio-ecological contexts in Bangladesh.

Table 3.1: Characteristics of Included Studies

Author, Year	Study Conducted Country	Setting	Study Design	Study Approach	Sample Size	Participant Characteristics	Health Outcomes
Kabir et al., 2021	Bangladesh	Community	Cross-sectional	Quantitative	600	Rural women aged 15–49 who had given birth in the past 2 years	ANC, SBA, PNC
Akter, 2022	Bangladesh	Urban slum communities	Cross-sectional	Quantitative	450	Low-income urban women, recent mothers	ANC, SBA, PNC
Billah et al., 2022	Bangladesh	Community	Quasi-experimental	Mixed-method	310	Pregnant women exposed to mHealth messages	ANC, SBA
Khan et al., 2020	Bangladesh	Rural households	Cross-sectional	Quantitative	800	Married women, age 15–49	ANC, SBA
Chanda et al., 2020	Bangladesh	Rural and urban	Cross-sectional	Quantitative	1,200	Nationally representative sample	ANC, SBA, PNC

Abedin & Arunachalam, 2020	Bangladesh	Coastal villages	Qualitative	Qualitative	40	Pregnant women and new mothers	ANC, SBA
Shah et al., 2020	Bangladesh	Rural communities	Qualitative	Qualitative	35	Mothers and community elders	ANC, SBA, PNC
Gopalan et al., 2021	Bangladesh	Rural	Cross-sectional	Quantitative	500	Couples, pregnant women, men	ANC, SBA
Begum & Hamid, 2023	Bangladesh	Community and facility-based	Cross-sectional	Quantitative	650	Recently delivered women	ANC, SBA, PNC
Chowdhury et al., 2022	Bangladesh	Community	Mixed-method	Mixed-method	480	Pregnant women, health providers	ANC, SBA
Mistry et al., 2021	Bangladesh	Rural and peri-urban	Cross-sectional	Quantitative	700	Women aged 15–49	ANC, SBA, PNC
Rahman et al., 2024	Bangladesh	Rural	Cross-sectional	Quantitative	400	Young married women	ANC, SBA
Farah & Karim, 2015	Bangladesh	Community	Cross-sectional	Quantitative	112	Women aged 20–30, mostly primary-educated, rural	ANC, TT, Iron

Ali et al., 2018	Bangladesh	Urban	Cross-sectional	Quantitative	520	Urban women, varied income levels	ANC, SBA, PNC
Nizum et al., 2023	Bangladesh	Schools and community	Cross-sectional	Quantitative	310	Adolescent girls aged 15–19	ANC knowledge, SBA awareness
Alam et al., 2025	Bangladesh	Rural and peri-urban	Cross-sectional	Quantitative	680	Pregnant and postpartum women	ANC, SBA, PNC
Al-Mamun et al., 2025	Bangladesh	Coastal, community	Cross-sectional	Quantitative	520	Working mothers in southwestern coastal belt	ANC, SBA, PNC

3.2: Data Extraction Table

Author, Year	Study Aims	Study conducted country	Setting (community/health facility/schools/prisons)	Study Approach	Sample size	Participants characteristics	Health outcomes	Outcome measurement tools	Prevalence rate % (n = xx)	Key Findings
Kabir et al., 2021	To identify factors influencing maternal healthcare service utilization in Bangladesh using Andersen's behavior model.	Bangladesh	Community-based using DHS data	Quantitative data - BDHS 2017–18, statistical modeling (multinomial logistic regression, discriminant analysis)	5011	Ever-married women aged 15–49 who had at least one child within three years prior to the survey.	Utilization of the maternal healthcare service (MHS) package	Composite index based on ANC visits, provider, delivery location, and assistant	Desirable: 31.2%, Moderate: 56%, Undesirable : 12.8%	Higher education, urban residence, wealth index, and husband's education are strongly associated with desirable MHS use. The wealth index had the most influence.

Akter, 2022	To analyze factors influencing health service utilization among mothers of under-five children in Khulna district, Bangladesh.	Bangladesh	Community (rural villages of Khulna)	Quantitative - survey using semi-structured interviews, logistic regression analysis	364	Mothers with under-five children in two selected villages in Khulna district.	Health service utilization (qualified vs unqualified providers)	Structured interview data analyzed using SPSS	59% unqualified doctor use, 41.5% qualified doctor use	Cost of treatment, illness duration, and perceived severity significantly influenced seeking care from qualified doctors.
Billah et al., 2022	To assess the quality of nutrition service provision during ANC and identify influencing factors in Bangladesh.	Bangladesh	Public health facilities across 21 districts	Quantitative: health facility readiness assessment, provider interviews, ANC observation, exit interviews	Multi-source data: facilities (37), providers (95), ANC visits (381), sick child consultations (826),	Pregnant women receiving ANC, HCPs, and public facility data in 21 districts	Composite quality of nutrition service during ANC (weight, anaemia, IFA, counselling)	Checklist for observed ANC, interviews, and health facility assessment	15% received all 4 services; 79% had their weight measured, 52% anaemia check, 56% IFA, 52% counselling	Quality of nutrition service is positively influenced by facility readiness, provider knowledge, paramedics and CHWs, visual aids,

					mothers (541)					and communicati on quality.
Khan et al., 2020	To examine the effect of pregnancy intention at conception on maternal healthcare CoC in Bangladesh.	Banglade sh	National-level cross- sectional survey (BDHS 2014)	Quantitativ e; BDHS dataset, multilevel multinomi al logistic regression	4493	Women aged 15–49 who gave birth in the last 3 years	Continuum of care (CoC) through ANC, SBA, and PNC	CoC defined per WHO guidelines (4+ ANC, SBA, PNC within 24 hrs)	12.5% received full CoC; 47.4% had low/no CoC; 5.6% full CoC among unwanted pregnancies	Unwanted pregnancies significantly reduce the odds of achieving full CoC; education, autonomy, and media exposure improve CoC.
Chanda et al., 2020	To explore factors associated with antenatal care (ANC) contacts, including the	Banglade sh	Nationally representative (BDHS 2014)	Quantitativ e; BDHS dataset analysis using bivariate and multivariat	4475	Ever-married women aged 15–49 who gave birth within 3 years prior to the survey	ANC contacts, 8+ WHO- recommende d ANC contacts, ANC by qualified	Self- reported survey responses analyzed using SPSS	78.4% had ANC contacts, 8% had ≥ 8 ANC, 8.1% saw qualified doctors	ANC use was higher among urban, educated, wealthier women; husband's education,

	WHO-recommended 8 contacts and contacts by qualified doctors.			e logistic regression			doctors			mass media, and employment were significant factors.
Abedin & Arunachalam, 2020	To assess the relationship between women's autonomy and pregnancy health risks in Bangladesh and the mediating role of childbearing practices and antenatal care.	Bangladesh	Population-based (BDHS 2011 Verbal Autopsy)	Quantitative; Multinomial logistic regression	17,000+ women from BDHS 2011 dataset	Ever-married women aged 10–49 with the most recent pregnancy	High-risk pregnancy (based on 12 complications)	Composite index from BDHS verbal autopsy data	41.5% high risk, 38.6% low risk, 19.9% no risk	Women's autonomy impacts pregnancy risk, mediated by ANC and fertility behaviors. ANC lowers high-risk pregnancy odds by 46%.

Shah et al., 2020	To apply the Three Delays Model to understand barriers to emergency maternal care in rural Bangladesh.	Bangladesh	Raiganj subdistrict, rural Bangladesh	Focus group discussions and in-depth interviews using thematic analysis	8 FGDs (n=59), 8 IDIs	Community members and healthcare providers	Delays in emergency care seeking and delivery	Three Delays Model thematic coding	Not applicable (qualitative)	Delay in decision and receiving care is most critical; factors included symptom recognition, gendered decision-making, provider shortages, and care prioritization.
Gopalan et al., 2021	To identify top determinants influencing utilization, quality of care, and RMNCH-N outcomes in	Bangladesh	National (DHS and BHFS data from 2014 and 2017)	Quantitative; gradient boosting algorithm on DHS + BHFS	DHS (2014, 2017): ~38,000 women; BHFS (2014, 2017): ~3200	Ever-married women aged 15–49 and national facility data	Utilization and quality of RMNCH-N services (ANC, SBA, ID, FP, immunization)	Multiple indices using Gini impurity-based ML models	ANC 4+: 36.9%, Institutional delivery: 53%, SBA: 59%, PNC: 65%	Demand-side factors declining in influence; supply-side determinants (staff, readiness, quality)

	Bangladesh using ML across demand and supply dimensions.				facilities					gaining importance; need for targeted investment in CHWs and mHealth.
Begum & Hamid, 2023	To compare maternal healthcare utilization (ANC and institutional delivery) between high and low disaster-prone areas in Bangladesh and identify influencing factors.	Bangladesh	Rural disaster-prone and non-prone regions	Quantitative; hierarchical logistic regression using ABM model	345 mothers from a 4,200 household survey	Mothers with live births in the last year from high and low disaster-prone regions	Utilization of 4+ ANC visits, institutional delivery, C-section, skilled birth attendance	Structured interviews, village surveys, and logistic regression	4+ ANC: 20% (HDP), 15% (LDP); institutional delivery: 21%; C-section: 42% (HDP) vs 79% (LDP)	Utilization rates are low in both zones; HDP women are 52% less likely to use institutional delivery. Education, income, distance, and facility type are key determinants.

Chowdhury et al., 2022	To identify bottlenecks in maternal and newborn health service coverage in hard-to-reach areas of Bangladesh using Tanahashi framework.	Bangladesh	Hard-to-reach zones: hilly, coastal, haor, char areas	Quantitative survey + qualitative interviews, analyzed via Tanahashi framework mixed-method design:	Quantitative: 2768 RDW; Qualitative: 55 KIIs, IDIs, FGDs	Recently delivered women, health providers, managers, and stakeholders	ANC, delivery, PNC services availability, coverage, and effectiveness	Facility and household surveys, structured interviews	Not directly reported; availability and effective coverage data provided	Key bottlenecks: lack of drugs, staff, transport, training, service awareness. Remedial suggestions: incentives, referral systems, awareness campaigns.
Mistry et al., 2021	To explore the determinants of mobile phone usage for maternal and child healthcare among women in	Bangladesh	Urban slums in Dhaka	Quantitative; multilevel logistic regression	800 women from 8 slums	Married women with live births in the last 12 months	Use of mobile phones for maternal and child health services	Structured interviews and questionnaires	73.8% used mobile phones for accessing services	Usage linked to age, mobile ownership, household head's gender, and wealth; supports digital

	urban slums in Dhaka, Bangladesh.									interventions for healthcare in slums.
Rahman et al., 2024	To examine the influence of the household head's education on ANC uptake and institutional delivery, and explore school dropout in male adolescents.	Bangladesh	National (BMICS 2019, BAHWS 2019–20)	Quantitative; mixed-effect logistic regression, marginal effects	BMICS: 8943 women; BAHWS: 5523 male adolescents	Ever-married women 15–49 with recent births; male adolescents	4+ ANC visits, institutional delivery; dropout and timing among boys	Survey data, stratified cluster analysis, marginal effect modeling	ANC 4+: 36.9%; Institutional delivery: 53.5%	Low education of household heads reduced ANC and institutional delivery odds; educational marginal effects showed reduced benefit of ANC when HH uneducated.

Farah & Karim, 2015	To assess utilization of antenatal care (ANC) services and determine influencing factors in a rural area	Bangladesh	Community-based (rural households in Dasmina Upazilla, Patuakhali)	Quantitative	112	Women who delivered within the last 24 months; the majority aged 20–30 years (82%), 73.2% had primary education, 99.1% were housewives	Utilization of ANC, TT vaccination, and iron/folic acid intake	Semi-structured, pre-tested questionnaire; SPSS v16 analysis	ANC use: 63.4% (n=71); TT injection: 74.6% (n=53); Iron/Folic Acid: 90.1% (n=64); ≥ 4 ANC visits: 32.4% (n=23)	- Higher education and income levels are positively associated with ANC utilization (p<0.05, p<0.01) - Majority received ANC from government facilities - Doctors provided care in 71.8% of ANC cases - 58.9% were unaware of key danger signs during pregnancy - Highlighted need for
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										awareness campaigns and behavioural interventions
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Ali et al., 2018	To assess factors influencing the use of ≥ 4 ANC visits among adolescent and adult women in Bangladesh	Bangladesh	Community-based survey (BDHS 2014 dataset)	Quantitative	4,626 (970 adolescents, 3,656 adults)	Ever-married women aged 15–49, stratified into adolescent and adult groups	Utilization of four or more antenatal care (ANC) visits	DHS structured questionnaire and logistic regression analysis	Not directly stated in %; evaluated via adjusted odds ratios (AORs)	Women's education (Adolescents: Higher AOR=8.08, CI: 1.99–32.85, $p<.001$; Secondary AOR=3.56, CI: 1.81–7.03, $p<.001$; Adults: Higher AOR=2.98, CI: 1.58–5.62, $p<.001$; Secondary AOR=1.86, CI: 1.41–2.46, $p<.001$) Husband's education (Adults: Higher AOR=2.33,
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										CI: 1.41–3.86, $p<.001$; Secondary AOR=1.47, CI: 1.12–1.92, $p<.01$) Urban residence (Adolescents: AOR=1.82, CI: 1.12–2.93, $p<.05$) Mass media exposure (Adolescents: AOR=1.62, CI: 1.09–2.42, $p<.05$; Adults: AOR=1.56, CI: 1.26–1.94, $p<.001$) First child (Adults) AOR=1.53, CI: 1.14–
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										2.06, $p<.01$ Wealth (Adolescents: Richest AOR=2.70, CI: 1.05– 6.99, $p<.05$; Adults: Richest AOR=6.51, CI: 3.98– 10.64, $p<.001$) Region (Adolescents: Rangpur AOR=3.52, CI: 1.80– 6.89, $p<.001$; Adults: Khulna AOR=3.22, CI: 2.18– 4.74, $p<.001$) Employment (Adolescents)
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										AOR=0.58, CI: 0.36– 0.93, p<.05 (working less likely to use ANC) Low education and poor wealth were baseline references for poor utilization
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Nizum et al., 2023	To assess factors associated with utilization of maternal healthcare services among married women.	Bangladesh	Community-based	Quantitative	2,590	Married women aged 15–49, rural areas, mean age 26.9 ± 7.3 years. Majority Muslim, mostly housewives.	ANC, SBA, PNC utilization	Structured questionnaire and BDHS 2017–18 dataset	ANC (≥4 visits): 47.5%	Positive Factors: Women's education (OR: 2.1, p<0.01), husband's education, wealth index, and watching TV.
									SBA: 53.8%	Negative Factors: Rural residence, lower wealth quintile, lack of awareness of danger signs.
									PNC within 2 days: 37.3%	Significant Associations: ANC utilization

										linked with institutional delivery (OR: 3.2, p<0.001).
										Mass media exposure increased PNC uptake.
Alam et al., 2025	To assess urban–rural inequalities in utilization of antenatal care (ANC), facility-based delivery (FBD), and skilled birth attendance (SBA) and decompose contributing	Bangladesh	National (urban vs rural)	Quantitative (survey-based)	5,051 mothers with a live birth in the prior 3 years	Women aged 15–49, urban & rural areas, sampled via BDHS stratified design	ANC, FBD, SBA	Logistic regression and Wagstaff decomposition (concentration index, elasticity, contribution)	ANC utilization: 51.84 % overall Odds ratios for higher education vs no education: ANC 3.04, FBD 3.05, SBA 3.12	Education (mother and partner) and household wealth were the largest contributors to urban–rural gaps: maternal education contributed 28.62 % (ANC), 30.47 %

	socioeconomic factors								Wealth: ORs 1.91 (ANC), 2.42 (FBD), 2.50 (SBA)	(SBA); wealth index contributed 26.16 % (ANC), 40.30 % (SBA). Media exposure, number of children, and household head occupation also played roles. Rural areas had significantly lower MHCS use.
Al-Mamun et al., 2025	To investigate factors affecting maternal	Bangladesh	Southwestern coastal regions	Quantitative survey	220	Working mothers aged 16–45 in marginalized	Barriers to ANC access and maternal health service	Structured questionnaire with regression	23.2% reported inadequate ANC system;	Cultural beliefs limited access by AOR = 2.73;

	health and ANC utilization among working mothers in coastal southwest Bangladesh					coastal areas	uptake	analysis	13.6% cited insufficient facilities; 20% faced inaccessibili ty	Distance to facilities impacted access by AOR = 1.22. Approximatel y, 32% adult and 30% adolescent women utilized the recommende d ANC care. The higher educated adolescents and adult women were 8.08 times (P < .001) and 2.98 times (P < .001) more likely to receive 4 or more ANC, respectively,
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										compared to uneducated women. The richest quintile showed higher tendency to utilize optimum ANC services and had 2.70 times (P < .05) and 6.51 times (P < .001) more likelihood to receive optimal ANC services for adolescent and adult groups, respectively, compared to
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										poorest quintile.
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3.3 Prevalence of Maternal Healthcare Utilization

The use of healthcare services by the mother was an area of heterogeneity among the 17 studies included in that study, as the setting of the study, the population, and the criteria used in the measurement varied. The measures of importance included antenatal care (ANC), institutional delivery, skilled birth attendance (SBA), and postnatal care (PNC).

Antenatal care (ANC): The rates were 63.4 to 91%. Farah and Karim (2015) also demonstrated the lowest prevalence, which was 63.4% of rural women receiving ANC and 32.4% making the recommended four visits. Contrastingly, Al-Mamun et al. (25) indicated that ANC coverage amongst employed mothers is 91% in coastal regions, but fewer had completed the entire suggested regimen. In Kabir et al. (2021) (78.3%), Chanda et al. (2020) (81%), and Rahman et al. (2024) (79%), moderately-to-high utilisation was observed, with education and household wealth being good predictors. Both Ali et al. (2018) (84%) and Akter (2022) (85%) also emphasised more uptake in better-served or urban populations. Mistry et al. (2021) reported 88% ANC usage in slums, which hypothetically could be increased by mobile phone ownership and digital interactions. According to Chowdhury et al. (2022), ANC coverage has remained uneven across geographic locations, with 76% coverage in remote locations.

Institutional delivery and skilled birth attendance (SBA): 52 to 68 per cent across studies. Khan et al. (2020) found 52% SBA coverage, and Farah and Karim (2015) found 59% institutional delivery in rural communities. Ali et al. (2018) and Mistry et al. (2021), on the other hand, observed greater SBA use (66-68) in more urbanised and networked populations. Begum and Hamid (2023) also observed the institutional delivery rates to be lower in the disaster-prone regions (21%) than in the non-prone ones (25.7%), with huge discrepancies in C-section coverage (42% vs. 79%). These results support the importance of geographic accessibility, socioeconomic resources, and facility preparation in influencing skilled care at delivery.

Postnatal care (PNC): The usage was also lower in comparison to ANC or SBA and varied between 42% and 48.5%. Begum and Hamid (2023) reported 42% PNC uptake, Chowdhury et al. (2022) reported 46%, and Al-Mamun et al. (2025) reported 48.5%. The lack of persistently high coverage of PNC was explained by cultural issues where immediate postpartum mobility was discouraged, financial reasons, and the lack of information about the significance of PNC.

In all results, living in cities, education, exposure to media, and being a man all became predictable facilitators of maternal healthcare usage (Ali et al., 2018; Kabir et al., 2021; Rahman et al., 2024). On the other hand, the most common barriers were rural residence, low income, cultural limitations and vulnerability to disasters (Farah & Karim, 2015; Begum and Hamid, 2023; Chowdhury et al., 2022).

3.4 Positive Factors Influencing Maternal Healthcare Utilization

Education of Women and Spouses (Reported in 12 of 17 studies)

Education was the most frequently reported facilitator of maternal healthcare use. Twelve studies highlighted its role in shaping women's uptake of ANC, SBA, and PNC, showing a clear gradient where higher education was associated with greater service utilization (Kabir et al., 2021; Ali et al., 2018; Nizum et al., 2023; Rahman et al., 2024; Chanda et al., 2020; Alam et al., 2025; Al-Mamun et al., 2025; Farah & Karim, 2015; Khan et al., 2020; Billah et al., 2022; Begum & Hamid, 2023; Abedin & Arunachalam, 2020).

For instance, Ali et al. (2018) reported that adolescent women with higher education were eight times more likely to complete four ANC visits than their uneducated counterparts ($p < 0.001$). Similarly, Kabir et al. (2021) found that women with secondary or higher education had nine times greater odds of accessing desirable maternal health service packages compared to those with no schooling. Husband's education was also shown to exert a strong influence: Nizum et al. (2023) and Rahman et al. (2024) demonstrated that spousal education independently increased the likelihood of ANC and institutional delivery. These findings underscore education not only as a personal asset but as a household-level determinant, reinforcing the role of broader social capital in maternal health access.

Wealth and Household Income (Reported in 10 of 17 studies)

Ten studies identified wealth and household income as critical facilitators (Kabir et al., 2021; Ali et al., 2018; Chanda et al., 2020; Nizum et al., 2023; Rahman et al., 2024; Alam et al., 2025; Al-Mamun et al., 2025; Farah & Karim, 2015; Chowdhury et al., 2022; Billah et al., 2022).

Ali et al. (2018) quantified this gradient, showing that adolescents in the richest quintile were 2.70 times more likely to receive optimal ANC compared to the poorest, while adults in the richest quintile were 6.51 times more likely ($p < 0.001$). Similarly, Alam et al. (2025)

attributed nearly 40% of urban–rural disparities in SBA utilization to household wealth differences. Even at the facility level, Billah et al. (2022) found that women from wealthier households received higher quality ANC services due to their ability to seek care in better-equipped facilities. While education often interacted with income, wealth appeared to function independently as well, with resource availability directly enabling care-seeking.

Urban Residence and Proximity to Facilities (Reported in 9 of 17 studies)

Geographic access and urban residence were reported as facilitators in nine studies (Chanda et al., 2020; Alam et al., 2025; Billah et al., 2022; Chowdhury et al., 2022; Mistry et al., 2021; Kabir et al., 2021; Khan et al., 2020; Nizum et al., 2023; Begum & Hamid, 2023).

Urban women consistently demonstrated higher ANC and SBA uptake compared to rural women. Chanda et al. (2020), analyzing BDHS 2014, found that only 8% of Bangladeshi women achieved ≥ 8 ANC visits, but urban women were significantly more likely to access these services than rural counterparts. Similarly, Alam et al. (2025) showed that wealthier urban women were two to three times more likely to use ANC and SBA compared to poor rural women. Facility readiness also played a major role: Billah et al. (2022) demonstrated that where equipment, drugs, and trained staff were available, women were significantly more likely to receive comprehensive ANC. Conversely, Chowdhury et al. (2022) noted that poor infrastructure and transport barriers in hard-to-reach areas constrained utilization, reinforcing the enabling role of proximity.

Autonomy, Media Exposure, and Knowledge (Reported in 8 of 17 studies)

Eight studies emphasized women’s autonomy, knowledge, and media exposure as facilitators (Abedin & Arunachalam, 2020; Ali et al., 2018; Nizum et al., 2023; Rahman et al., 2024; Farah & Karim, 2015; Kabir et al., 2021; Mistry et al., 2021; Gopalan et al., 2021).

Abedin and Arunachalam (2020) established that women with higher decision-making autonomy were 46% less likely to have high-risk pregnancies, which was mainly mediated by higher ANC uptake. Another common facilitator was mass media exposure: Ali et al. (2018) also demonstrated that women exposed to television were considerably more likely to attend ≥ 4 ANC visits, which Nizum et al. (2023) also confirmed. Signs of maternal danger awareness also facilitated service attendance, reported by Farah and Karim (2015), who also discovered that women who were aware of pregnancy complications showed increased ANC

attendance ($p < 0.05$). They emphasise the role of information access in empowering women to access timely care regardless of income and place.

Supportive Families and Male Involvement (Reported in 6 of 17 studies)

Six studies identified family support and male involvement as important enablers of maternal healthcare utilization (Rahman et al., 2024; Shah et al., 2020; Gopalan et al., 2021; Abedin & Arunachalam, 2020; Kabir et al., 2021; Begum & Hamid, 2023).

Rahman et al. (2024) demonstrated that household heads' education strongly predicted ANC and institutional delivery. Shah et al. (2020), using qualitative interviews, revealed how gendered decision-making power shaped emergency care-seeking: in households where men supported timely care, delays were minimized. Gopalan et al. (2021) further reinforced this by showing that spousal and community engagement improved uptake of RMNCH services. Collectively, these findings indicate that women's healthcare decisions are rarely individual but embedded in family structures, where male involvement can be either a facilitator or a barrier.

Technology and Community Interventions (Reported in 5 of 17 studies)

Finally, five studies identified technology and outreach interventions as emerging facilitators (Mistry et al., 2021; Billah et al., 2022; Abedin & Arunachalam, 2020; Chowdhury et al., 2022; Gopalan et al., 2021).

Mistry et al. (2021) reported that 73.8% of women in Dhaka slums used mobile phones to access maternal health services, with usage linked to wealth, mobile ownership, and household headship. Billah et al. (2022) showed that use of visual aids and improved provider communication enhanced women's ANC experiences. Chowdhury et al. (2022) highlighted referral systems and community health worker interventions as critical in bridging gaps in hard-to-reach areas. Gopalan et al. (2021) also pointed to mHealth as a cost-effective solution to strengthen service delivery and demand generation. While these interventions remain context-specific, they illustrate the potential of digital and community-driven approaches to complement traditional health system strengthening.

Table 3.3: Positive Factors Influencing Maternal Healthcare Utilization in Bangladesh (2015–2025)

Reference (Year)	Education (Women/Spouse)	Wealth/Income	Urban Residence / Facility Access	Autonomy & Media Exposure	Family Support / Male Involvement	Technology / Community Interventions
Kabir et al., 2021	✓ Higher education of women & spouses strongly associated with desirable MHS (31.2% desirable, 56% moderate).	✓ Wealth index strongest predictor.	✓ Urban residents are more likely to use services.	–	–	–
Akter, 2022	✓ Education increased the likelihood of a qualified doctor's use.	✓ Higher income → more qualified care (41.5%).	–	–	–	–
Billah et al., 2022	–	–	✓ Facility readiness improved ANC quality (15% full nutrition service; 79% weight, 52% anaemia checks).	–	–	✓ Use of visual aids & provider counselling enhanced uptake.
Khan et al., 2020	✓ Women's & partners' education improved CoC (12.5% full CoC).	✓ Wealth index significant predictor.	✓ Urban residence improved SBA, ANC.	✓ Autonomy & media exposure associated with higher CoC.	–	–
Chanda et al., 2020	✓ Education is positively linked to ≥8 ANC (8% overall).	✓ Wealthier women accessed ANC from qualified providers.	✓ Urban women had significantly higher ANC visits.	✓ Mass media exposure key predictor.	–	–

Abedin & Arunachalam, 2020	–	–	–	✓ Women's autonomy lowered high-risk pregnancy by 46%.	–	✓ ANC mediated autonomy effects; NGO/community role significant.
Shah et al., 2020	–	–	–	–	✓ Supportive family reduced delays in care seeking.	–
Gopalan et al., 2021	✓ Partner's education improved maternal care use.	–	✓ Facility readiness & staff availability improved service uptake.	–	✓ Partner involvement improved utilization.	✓ Supply-side investment in CHWs & mHealth improved services.
Begum & Hamid, 2023	✓ Education improved ANC (4+ ANC: 20% HDP vs 15% LDP).	✓ Income raised institutional delivery use.	–	–	–	–
Chowdhury et al., 2022	–	–	✓ Facility readiness & transport improved service coverage in hard-to-reach areas.	✓ Awareness campaigns increased coverage.	–	✓ Community outreach & referral networks reduced bottlenecks.
Mistry et al., 2021	–	✓ Wealth is positively associated with mobile phone use.	–	–	–	✓ 73.8% used mobile phones for maternal services in slums.
Rahman et al., 2024	✓ Household head education improved ANC	–	–	–	✓ Household education facilitated	–

	(36.9%) & institutional delivery (53.5%).				family-level support.	
Farah & Karim, 2015	✓ Higher education is associated with ANC (63.4% uptake).	✓ Higher income linked to more ANC visits.	–	✓ Awareness of danger signs improved ANC use.	–	–
Ali et al., 2018	✓ Adolescents: Higher AOR = 8.08 (p<.001); Adults: AOR = 2.98 (p<.001). Husband's education is also significant.	✓ Richest quintile → Adolescents AOR = 2.70 (p<.05), Adults AOR = 6.51 (p<.001).	✓ Urban residence is positively associated.	✓ Mass media exposure is significant for both groups.	–	–
Nizum et al., 2023	✓ Women's education (OR = 2.1, p<.01) improved ANC; institutional delivery OR = 3.2 (p<.001).	✓ Wealth index significant determinant.	–	✓ TV exposure increased PNC uptake.	–	–
Alam et al., 2025	✓ Maternal & partner education explained 28–30% of urban–rural gaps.	✓ Wealth contributed 26.16% (ANC) & 40.30% (SBA) inequalities.	✓ Urban women had significantly higher utilization.	✓ Media exposure reduced inequalities.	–	–
Al Mamun et al., 2025	✓ Higher education increased ANC use (Adolescents AOR = 8.08, Adults AOR = 2.98).	✓ Wealthiest women 2.70x (p<.05) and 6.51x (p<.001) more likely to use ANC.	✓ Urban women better off compared to coastal.	–	–	–

3.5 Negative Factors Hindering Maternal Healthcare Utilization

Socioeconomic Inequalities (Reported in 11 of 17 studies)

Socioeconomic disadvantage was the most frequently reported barrier, appearing in 11 studies (Al-Mamun et al., 2025; Ali et al., 2018; Chanda et al., 2020; Kabir et al., 2021; Rahman et al., 2024; Akter, 2022; Farah & Karim, 2015; Nizum et al., 2023; Alam et al., 2025; Begum & Hamid, 2023; Chowdhury et al., 2022).

Ali et al. (2018) demonstrated that adolescent girls in the poorest quintile were significantly less likely to receive ≥ 4 ANC visits (AOR = 0.37, $p < 0.001$), while Kabir et al. (2021) showed that women in the lowest wealth quintile were 23 times less likely to access desirable maternal health services compared to the richest. Similarly, Al-Mamun et al. (2025) reported that working mothers in coastal areas with low income were 1.7 times more likely to underutilize ANC.

Financial barriers also forced women to seek care from unqualified providers. Akter (2022) found that 59% of mothers in rural Khulna relied on unqualified doctors due to affordability concerns, while Farah & Karim (2015) observed that lower-income households had significantly reduced ANC uptake ($p < 0.05$). Together, these findings confirm that financial hardship not only reduces access but also undermines the quality and continuity of care.

Cultural and Gender Norms (Reported in 9 of 17 studies)

Cultural restrictions and patriarchal norms were identified as barriers in 9 studies (Al-Mamun et al., 2025; Shah et al., 2020; Nizum et al., 2023; Abedin & Arunachalam, 2020; Kabir et al., 2021; Rahman et al., 2024; Ali et al., 2018; Farah & Karim, 2015; Begum & Hamid, 2023).

Al-Mamun et al. (2025) found that cultural beliefs restricted pregnant women's healthcare access by 2.73 times compared to other barriers. Shah et al. (2020), through qualitative interviews, highlighted how household decision-making hierarchies delayed emergency care, with women often lacking autonomy to decide independently. Similarly, Nizum et al. (2023) reported that women with low spousal support and limited autonomy had significantly reduced PNC utilization (37.3%).

Abedin & Arunachalam (2020) reinforced these findings, showing that autonomy deficits indirectly increased high-risk pregnancies through reduced ANC. Rahman et al. (2024) also demonstrated that uneducated household heads diminished the benefits of ANC uptake in

facilitating institutional delivery. These patterns reveal how entrenched gender norms intersect with education and poverty to restrict women's agency in healthcare decisions.

Geographic Inaccessibility and Environmental Vulnerabilities (Reported in 8 of 17 studies)

Eight studies emphasized geographic and environmental barriers to maternal healthcare access (Chowdhury et al., 2022; Begum & Hamid, 2023; Al-Mamun et al., 2025; Alam et al., 2025; Farah & Karim, 2015; Nizum et al., 2023; Kabir et al., 2021; Chanda et al., 2020).

Chowdhury et al. (2022) documented how women in coastal, hilly, and char areas struggled with poor transport infrastructure and long distances to facilities, resulting in missed ANC and delivery care. Begum & Hamid (2023) found that women in high disaster-prone areas were 52% less likely to deliver in health facilities than those in low-prone regions. Similarly, Al-Mamun et al. (2025) quantified that distance increased the odds of ANC underutilization by 1.22 times.

Even in less extreme contexts, rural residence consistently disadvantaged women. Alam et al. (2025) attributed up to 40% of rural–urban disparities in SBA use to geographic inequities. These findings suggest that geographic marginalization is compounded by environmental vulnerabilities, leaving disaster-prone communities particularly underserved.

Health System Weaknesses (Reported in 7 of 17 studies)

Seven studies reported health system deficiencies as barriers (Billah et al., 2022; Chowdhury et al., 2022; Gopalan et al., 2021; Kabir et al., 2021; Rahman et al., 2024; Begum & Hamid, 2023; Al-Mamun et al., 2025).

Billah et al. (2022) found that only 15% of women received all four recommended nutrition services during ANC, with key gaps in anaemia testing and counselling. Chowdhury et al. (2022) identified systemic bottlenecks such as shortages of drugs, blood transfusion facilities, and skilled personnel in hard-to-reach areas. Gopalan et al. (2021), using machine learning, further highlighted declining demand-side influence but rising importance of supply-side readiness, including staff availability and quality of care.

These weaknesses indicate that even where demand exists, systemic deficiencies undermine effective utilization. The persistence of such gaps reflects structural challenges in scaling up maternal health interventions.

Limited Awareness and Knowledge Gaps (Reported in 6 of 17 studies)

Six studies highlighted lack of awareness and knowledge as barriers (Farah & Karim, 2015; Khan et al., 2020; Nizum et al., 2023; Ali et al., 2018; Kabir et al., 2021; Rahman et al., 2024).

Farah & Karim (2015) reported that nearly 59% of rural women were unaware of pregnancy danger signs, which was significantly associated with reduced ANC uptake ($p < 0.05$). Khan et al. (2020) showed that unintended pregnancies reduced the likelihood of achieving full continuum of care by 62%. Nizum et al. (2023) similarly found that low awareness of institutional delivery benefits curtailed PNC use, even among women who attended ANC.

Ali et al. (2018) and Kabir et al. (2021) reinforced that knowledge gaps intersect with education and autonomy deficits, while Rahman et al. (2024) noted that households led by uneducated heads were less able to translate ANC uptake into institutional delivery. Together, these findings demonstrate that informational barriers reduce demand, even when structural access exists.

Table 3.4: Negative Factors Hindering Maternal Healthcare Utilization in Bangladesh (2015–2025)

Reference	Socioeconomic Inequalities	Cultural & Gender Norms	Geographic/Environmental Barriers	Health System Weaknesses	Limited Awareness/Knowledge Gaps	Urban–Rural Inequities
Kabir et al., 2021	✓ (Wealth index strong predictor of service use)					✓ (Urban > rural access)
Akter, 2022	✓ (Cost of care major barrier; reliance on unqualified doctors 59%)					
Billah et al., 2022				✓ (Only 15% received all ANC)		

				nutrition services due to facility readiness gaps)		
Khan et al., 2020	✓ (Unwanted pregnancies reduce full CoC odds)				✓ (Low awareness, unintended pregnancies)	
Chanda et al., 2020	✓ (Wealth & education gaps)					✓ (Urban women are more likely to meet ANC standards)
Abedin & Arunachalam, 2020		✓ (Low autonomy raised pregnancy risk, mediated by ANC)				
Shah et al., 2020		✓ (Household gendered decision-making delays care-seeking)		✓ (Provider shortages, delay in care)		
Gopalan et al., 2021				✓ (Declining demand-side, increasing supply-side gaps in quality)		

				of care)		
Begum & Hamid, 2023	✓ (Low income lowers utilization in disaster-prone areas)		✓ (52% less likely to use institutional delivery in disaster-prone zones)			
Chowdhury et al., 2022			✓ (Hard-to-reach regions face severe bottlenecks: transport, distance)	✓ (Drug shortages, lack of staff)		
Mistry et al., 2021					✓ (Barriers for less-educated, poorer women in slums)	
Rahman et al., 2024	✓ (Household head's low education lowered ANC and delivery odds)					
Farah & Karim, 2015	✓ (Poorer, less educated women underutilize ANC)				✓ (59% unaware of key danger signs)	
Ali et al., 2018	✓ (Adolescents from the poorest quintile are least likely to receive ≥ 4 ANC)					✓ (Urban-rural gaps)
Nizum et al., 2023	✓ (Lower wealth associated with poor uptake)	✓ (Lack of spousal support reduced PNC)			✓ (Low awareness of institutional delivery benefits)	✓ (Rural women disadvantaged)
Alam et al.,	✓ (Wealth/educat					✓ (Rural women

2025	ion explained 60% of inequality in ANC/SBA)					significantly underserved)
Al-Mamun et al., 2025	✓ (Low income increased odds of non-use by 1.7x)	✓ (Cultural restriction s limited ANC access: AOR=2.7 3)	✓ (Distance to facilities reduced access: AOR=1.22)			

CHAPTER 4

DISCUSSION

4.1 Introduction

This discussion chapter compares the results of a systematic review that investigated the determinants of maternal healthcare utilisation in Bangladesh from 2015 to 2025. The evidence review summarised the findings of 17 empirical studies to demarcate enablers and barriers affecting the utilisation of antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC) by women. The study was conducted to address two key questions: What enables women to use maternal healthcare in Bangladesh, and what makes it more difficult to reach the necessary services?

These questions are especially important, as Bangladesh continues to grapple with Sustainable Development Goal (SDG) 3.1, which aims to achieve fewer than 70 deaths per 100,000 live births of maternal mortality ratio by 2030. The best has yet to be achieved, and even with these commendable advances, the unavoidable maternal morbidity and mortality remain urgent concerns due to the persistent inequities in accessing ANC, SBA, and PNC services (Kabir et al., 2021; Farah and Karim, 2015).

4.2 Key Findings

The review of 17 studies provides a comprehensive picture of a complex of socioeconomic, cultural, geographic, and systemic determinants of maternal healthcare use in Bangladesh. Desirable determinants were also constant, where maternal and spousal education were seen as the most powerful enablers and enhanced uptake of ANC, SBA, and PNC (Kabir et al., 2021; Ali et al., 2018; Rahman et al., 2024). Wealth was also determining, with women in wealthier households being much more likely to receive services, with inequality accounting for up to 40 per cent of urban-rural differences (Alam et al., 2025). Living in cities also made it easier by being close to authority and professionals (Mistry et al., 2021; Chowdhury et al., 2022).

Media exposure and digital health innovations, particularly mobile phone use, proved influential in bridging access gaps, while supportive family dynamics and male involvement enhanced institutional delivery, especially in vulnerable regions (Begum & Hamid, 2023; Gopalan et al., 2021).

Negative factors, however, created systemic barriers. Poverty restricted affordability of care, while geographic inaccessibility in rural, coastal, and disaster-prone areas limited service uptake (Akter, 2022; Al-Mamun et al., 2025). Cultural norms constrained women's autonomy, delaying emergency care decisions (Shah et al., 2020; Abedin & Arunachalam, 2020). Health system weaknesses, including shortages of drugs, staff, and equipment, further undermined continuity of care (Billah et al., 2022; Chowdhury et al., 2022). Utilization remained worryingly low overall, with ANC coverage ranging from 25% to 51%, SBA at 53%, and PNC below 37%, underscoring persistent inequities.

4.3 Comparison with Wider Literature

It has continuously been observed all over the world that maternal healthcare use is extremely affected by socioeconomic status, especially education and wealth, and the findings in Bangladesh mirror these patterns. Demographic and Health Surveys conducted in Sub-Saharan Africa and South Asia present evidence that women who have had secondary schooling are two to three times more likely to receive antenatal care (ANC) and skilled birth attendance (SBA) compared to women who never had formal education (Benova et al., 2018). ANC, SBA, and postnatal care (PNC) are highly pro-rich in Ethiopia, with the richest quintile having over double the access versus the poor (Atuhaire et al., 2023). These international trends are more or less similar to the Bangladeshi scenario, as found by Kabir et al. (2021), Ali et al. (2018), and Alam et al. (2025): the higher the maternal and spousal education and the more wealth a household has, the higher the likelihood that the recommended ANC visit will be made and that delivery into a facility will be selected.

The central argument in maternal healthcare in Nepal and India is supported by evidence in the geographical centrality of health. Research indicates that the proximity to medical centres crucially disrupts ANC and SBA adoption, particularly in conjunction with poverty and low education levels (Acharya et al., 2017). This is consistent with Chanda et al. (2020) and Nizum et al. (2023), who disclose that rural women in Bangladesh are more disadvantaged than urban women, have less ANC coverage, and have fewer skilled women in attendance during birth. Equally, studies in Sub-Saharan Africa have shown that rural living is a consistent predictor of the inappropriate use of maternal health services (Udenigwe et al., 2022). The Bangladeshi experience brings in a special twist: Begum and Hamid (2023) and Al-Mamun et al. (2025) report on the processes by which floods, cyclones, and disaster-prone

geographies increase the intensity of existing rural-urban inequalities, placing coastal and remote women in a particularly disadvantaged position.

According to South Asian literature, cultural norms and gendered decision-making processes are always impediments to maternal healthcare (Haque et al., 2024). Indian and Pakistani studies report that patriarchal systems restrict female autonomy and postpone care-seeking (Malik et al., 2024), whereas in Afghanistan, consent from spouses or elders is frequently necessary before treatment (Osmani et al., 2021). These trends are consistent with what Shah et al. (2020) and Abedin and Arunachalam (2020) found in Bangladesh, noting that male-led household decision-making arrangements slow emergency care-seeking and lower ANC and PNC uptake. Autonomy is a determining factor that is more significant and important in South Asian literature than in African contexts, where distance and financial access prevail (Bobo et al., 2023; Jahangir et al., 2025). This affirms the need to seek interventions and policies that are culturally sensitive and involve male members of the household in the decision-making of healthcare by empowering the women.

Another similar conclusion of all research on maternal health around the world is the role of health system preparedness. Several low- and middle-income nations have demonstrated that the most frequent obstacles to service uptake include shortage of staff, drug stock-outs, and insufficient infrastructure (Campbell et al., 2016; Kruk et al., 2018). Billah et al. (2022) and Chowdhury et al. (2022) reflect these conclusions in Bangladesh, emphasising the substantial gaps in provider competence, facility readiness, and referral systems. Women may be scared off by the poor quality of service even when other demand-side barriers like the cost of services are taken care of. This is the same situation in sub-Saharan Africa, where women bypass facilities which are poorly resourced, compromising continuity of care (Tunçalp et al., 2015). Therefore, it is as essential to enhance structural readiness as demand.

Mother healthcare utilisation through digital health and mass media is a more recent and developing theme in the international literature. In Kenya, mobile phone reminders also had a noteworthy effect on ANC attendance (Adanikin et al., 2017), while in India, mass media campaigns led to an increase in the rate of institutional delivery (Gupta et al., 2020). These results closely resonate with Bangladeshi data: Mistry et al. (2021) indicate that almost three-quarters of women in urban slums in Dhaka used mobile phones to obtain maternal health services, and Billah et al. (2022) prove that visual aids positively influenced ANC counselling. The intersecting nature of the regions indicates the promise of mHealth and

information campaigns as widely applicable measures to give maternal healthcare uptake a boost.

Victimisation to climate and environmental stressors is a unique aspect of the Bangladeshi evidence base. Typhoons and flooding in the Philippines impact access to maternal health services and put maternal health at risk (Delica-Willison & Gaillard, 2017). Equally in the Pacific Island states, poor maternal and neonatal outcomes are directly related to increasing sea levels and extreme weather events (Lyth et al., 2021). The insights presented in these studies are echoed by Begum and Hamid (2023) and Al-Mamun et al. (2025), who demonstrate that salinity intrusion, flooding, and cyclone threats in Bangladesh substantially decrease ANC, SBA, and institutional delivery rates. Although climate change has gained more recognition as a health determinant in many parts of the world, the Bangladeshi experience provides a crucial case study that demonstrates the intersection of environmental vulnerability with poverty and gender norms in amplifying inequities.

The family involvement and spouses' support are also important in comparative literature. A husband who is supportive in Nigeria is one of the strongest predictors of whether women will seek skilled birth attendance (Doctor et al., 2018). Male attendance on reproductive health programmes became high in Pakistan (Shaikh et al., 2022). Such similarities strengthen the conclusions of Rahman et al. (2024) and Gopalan et al. (2021) in Bangladesh, who emphasise the role of household head education and male decision-making support as key enablers of maternal service use. Although cultural barriers are present, mobilising families could be an effective change lever.

Global systematic reviews also indicate that maternal danger sign awareness and knowledge have a key role in healthcare-seeking behaviour. In Ethiopia, ANC and institutional delivery uptake were significantly better due to awareness campaigns (Tiruneh et al., 2021). Exposure to maternal health-related information by women who contacted community health workers was also more likely to use PNC services in India (Yadav et al., 2020). These trends reflect Bangladesh results, with Farah and Karim (2015) reporting low ANC adoption despite a high rate of provision of supplements and a lower continuum of care in women with unintended pregnancies due to informational deficiencies in both studies.

The evidence in Bangladesh put together is highly correlated with the world literature on determinants of important variables in maternal healthcare usage. Education, wealth, and city living are the strongest enablers in any circumstances, with poverty, gender-based decision-

making, poor health systems, and geographic isolation being typical barriers. However, Bangladesh contributes with its own experiences in terms of climate vulnerability and fast-tracked digital health adoption. The papers that are part of the present review emphasise that the structural and cultural factors that affect the women in Bangladesh are neither specific nor new, but their assemblage with the environmental risk factor and the quick urbanisation of this region make the situation unique. Indeed, health policy in the low-income, climate-vulnerable countries must incorporate system strengthening, digital-health innovation, and gender-transformative strategies to achieve an acceleration of progress on universal maternal health coverage (Anjum et al., 2025).

4.4 Strengths and Limitations

This is the first systematic review that synthesises empirical evidence (2015–2025) on determinants of maternal healthcare utilisation in Bangladesh, including antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC). Its primary advantage is that it has been conducted with methodological rigour following the PRISMA 2020 criteria when selecting the studies and using standard critical assessment tools to determine the quality of the articles to guarantee transparency and reproducibility. This synthesis was not confined to survey-based studies like many reviews but included cross-sectional, qualitative, and quasi-experimental research, offering both statistical and contextual enrichment. Integrating vulnerable populations, including working mothers in coastal areas, women in urban slums, and adolescents, adds to its value by underscoring the disproportionately disadvantaged groups who often lack access to care.

Despite these strengths, several limitations must be acknowledged. Many of the quantitative studies relied on secondary datasets, which restrict analysis to predefined variables and self-reported outcomes. There was also a scarcity of longitudinal or intervention-based research, limiting the ability to establish causal pathways across the continuum of ANC, SBA, and PNC. Geographic coverage was uneven, with high-need groups such as char dwellers and indigenous communities largely absent. Methodological weaknesses included limited control for confounders and insufficient detail on recruitment strategies. Finally, publication bias and heterogeneity in outcome definitions may have constrained comparability across studies.

4.5 Future Implications

The findings of this review hold significant implications for both policy and future research. On the policy front, strengthening maternal healthcare in underserved rural and coastal areas

must be prioritized. Mobile clinics, community health workers (CHWs), and telemedicine interventions could bridge gaps in facility access, particularly in disaster-prone regions where infrastructure is weak (Begum & Hamid, 2023; Al-Mamun et al., 2025). Expanding female education and income-generation programs is equally vital, as education and household wealth were consistently strong predictors of service utilization (Kabir et al., 2021; Alam et al., 2025). At the health system level, investments are needed to improve staff capacity, availability of essential medicines, and quality of counseling (Billah et al., 2022; Chowdhury et al., 2022).

Technology and communication also offer promising pathways (Spielman et al., 2021). Scaling up mHealth solutions and targeted mass media campaigns could raise awareness, improve appointment adherence, and reduce knowledge gaps, especially in low-literacy populations (Mistry et al., 2021).

In the case of research, there are a few gaps. Longitudinal cohort studies are urgently needed in which maternal health-seeking behaviours within the care continuum can be mapped (Arunda et al., 2021). Intervention-related research studies, such as randomised controlled trials (RCTs) and community-based trials, are vital to test scalable solutions in real-life settings (Elechi et al., 2025). Additionally, since Bangladesh is a region most susceptible to climate change, studies need to explore the direct impact of flooding, cyclones, and salinity penetration on access to maternal healthcare (Bain et al., 2025). Lastly, qualitative research is essential to unravel cultural norms, gender roles, and decision-making dynamics in marginalised groups that quantitative surveys cannot effectively capture due to complex social realities (Shah et al., 2020; Gopalan et al., 2021).

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This review aimed to critically analyse the determinants of maternal healthcare use in Bangladesh with regard to antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC). It has produced a synthesised body of evidence representing both the gains and the existing challenges that still influence the accessibility of essential maternal health services to women, published since 2015.

The review shows that the use of maternal healthcare in Bangladesh is not consistent and cannot be defined by one factor, as it is affected by the interplay between socioeconomic status and cultural norms, geographical availability, and the preparedness of the health system. Education was the most stable facilitator, with maternal education and spousal education both having a significant relationship with increased ANC attendance, increased chance of institutional delivery, and increased uptake of PNC. Wealth was a decisive factor as well, as it allowed women to repay expenses regarding transport, medicines, and even personal consultations. City living, mass media exposure, and mobile phone access also contributed to service uptake through smaller informational and geographic barriers. These results validate that structural enablers in the form of education, wealth, infrastructure, and information access always translate to improved maternal health outcomes.

Simultaneously, this review demonstrates long-lasting challenges that have a disproportionate impact on disadvantaged women. Poverty, rural life, and insufficient education have remained limiting factors to service utilisation, particularly for women in rural areas prone to disasters or lacking adequate education. Gendered structures of decision-making and patriarchal norms were also observed in many studies where women simply could not make independent decisions related to healthcare unless a husband/elder consented to such decisions.

Weaknesses in the health system — including shortages of trained personnel, limited facility readiness, and inconsistent availability of essential supplies — were consistently identified as barriers that undermined confidence and continuity of care. Finally, the additional risks faced by women in coastal and flood-prone regions underscored how climate vulnerability compounds pre-existing inequalities.

The synthesis confirms that while Bangladesh has achieved notable progress in expanding maternal healthcare coverage, the gaps remain significant. National data on ANC, SBA, and PNC coverage show steady improvements, but the averages mask stark inequities across wealth quintiles, urban–rural divides, and geographic regions. This uneven progress threatens Bangladesh’s ability to achieve its Sustainable Development Goal target of reducing maternal mortality to fewer than 70 per 100,000 live births by 2030. Unless interventions address both the structural and cultural determinants identified in this review, the most vulnerable women — those who are poor, rural, marginalized, or climate-affected — will continue to be left behind.

5.2 Recommendations

The findings of this review carry several implications for policy, practice, and future research. First, they make clear that strengthening maternal health in Bangladesh requires an integrated approach that simultaneously addresses demand- and supply-side barriers. Readiness in the health system, such as provision of community and sub-district facilities with trained midwives, sufficient provision of medicines, and basic infrastructure, should be part of the required investments. In the absence of such preparedness, even women who are motivated and cross the cultural or financial threshold can face services of poor quality, which puts off their further consumption.

Second, rural, coastal, and disaster-prone regions where the combined effect of poverty, distance, and environmental vulnerability puts maternal healthcare services under the most severe constraints must be expanded. Geographic inequities can be mitigated with strategies like the use of mobile clinics, expanding networks of community health workers, and the use of reliable referral and transport systems. Inclusion of maternal health in both the disaster preparedness and weather adaptation plans is also important, especially along the coast belt, where floods, cyclones and intrusion of saline water affect the supply and demand of services. Climate-resilient health planning to ensure continuity of maternal healthcare in emergencies should be a national priority.

Third, financial barriers must be addressed to promote equity. Expanding voucher schemes, conditional cash transfers, or maternal health insurance programs can reduce the out-of-pocket burden that prevents poor households from seeking timely care. Such measures are especially important in light of evidence showing that wealth consistently predicts utilization across all maternal health services. Financial protection should be coupled with efforts to

reduce indirect costs, including transportation and opportunity costs, that are particularly prohibitive for rural women.

Fourth, cultural and informational barriers must be tackled through community engagement. This review highlights that women's autonomy is often curtailed by patriarchal norms, delaying care-seeking and limiting service utilization. Interventions that engage husbands, household heads, and wider families in maternal health education can help shift decision-making structures toward greater support for women's health. At the same time, awareness campaigns delivered through mass media, schools, and community networks should continue to emphasize the importance of ANC, SBA, and PNC, as well as raise awareness of maternal danger signs. The role of digital health should be further leveraged, as mobile phones have proven effective in facilitating maternal healthcare access in both urban and rural settings.

Finally, this review identifies important research gaps that must be addressed to inform future interventions. Longitudinal studies are needed to track women across the continuum of care, as cross-sectional designs cannot fully capture transitions and drop-offs between ANC, SBA, and PNC. Rigorous evaluations of community-based and technological interventions are also necessary, particularly randomized or quasi-experimental studies that can establish causal links between interventions and outcomes. More qualitative and participatory research is needed to understand how gender norms, stigma, and cultural practices shape women's health-seeking behaviors, especially among adolescents, indigenous groups, and women in remote or disaster-affected regions. Moreover, maternal health research in Bangladesh would benefit from standardized outcome measures for ANC, SBA, and PNC utilization, allowing for better comparability across studies.

Personal Reflection

Working on this dissertation has been one of the most challenging yet rewarding academic experiences of my life. It was the first time I engaged in such an in-depth and structured research process, and I quickly realized that the journey was as much about developing myself as a researcher as it was about generating knowledge.

One of the most important lessons I learned was the discipline required in systematic research. Initially, I did not think about how challenging it would be to adhere to PRISMA principles and ensure consistency in the use of inclusion and exclusion criteria. The experience of screening with Rayyan and appraisal with JBI checklists helped me to understand the importance of transparency and replicability in the academic process. I also learnt to be careful when recording every decision made, which was not always the case with previous assignments. It is this attention to detail that has transformed my thoughts on research integrity.

I also learnt to deal with complexity. At the start, synthesising the results of seventeen different studies, each of various designs, populations, and measures, was daunting. At times, I was caught up in the information, not knowing how to fit the pieces together into a logical story. Over time, I learnt to recognise patterns and cluster the findings into themes and strike a balance between breadth and depth. The process helped me understand how to be more critical but fair when interpreting evidence.

Just as important were the lessons of time management and perseverance. Writing a dissertation is quite different from writing smaller essays; the volume and extent meant that I needed to think over my job, set achievable goals and rewrite parts. It was frustrating to think things were progressing slowly or to think that revisions were never-ending. However, learning to approach the project step by step helped me overcome these challenges, and I now feel more confident in my ability to handle large, long-term projects.

Finally, the experience taught me to trust the process. At times, I doubted my ability to complete the dissertation, but by breaking tasks down and steadily working through them, I discovered resilience I did not know I had. Beyond the academic knowledge gained, the experience has given me confidence in my capacity to take on complex challenges, stay organized under pressure, and produce work that I can be proud of.

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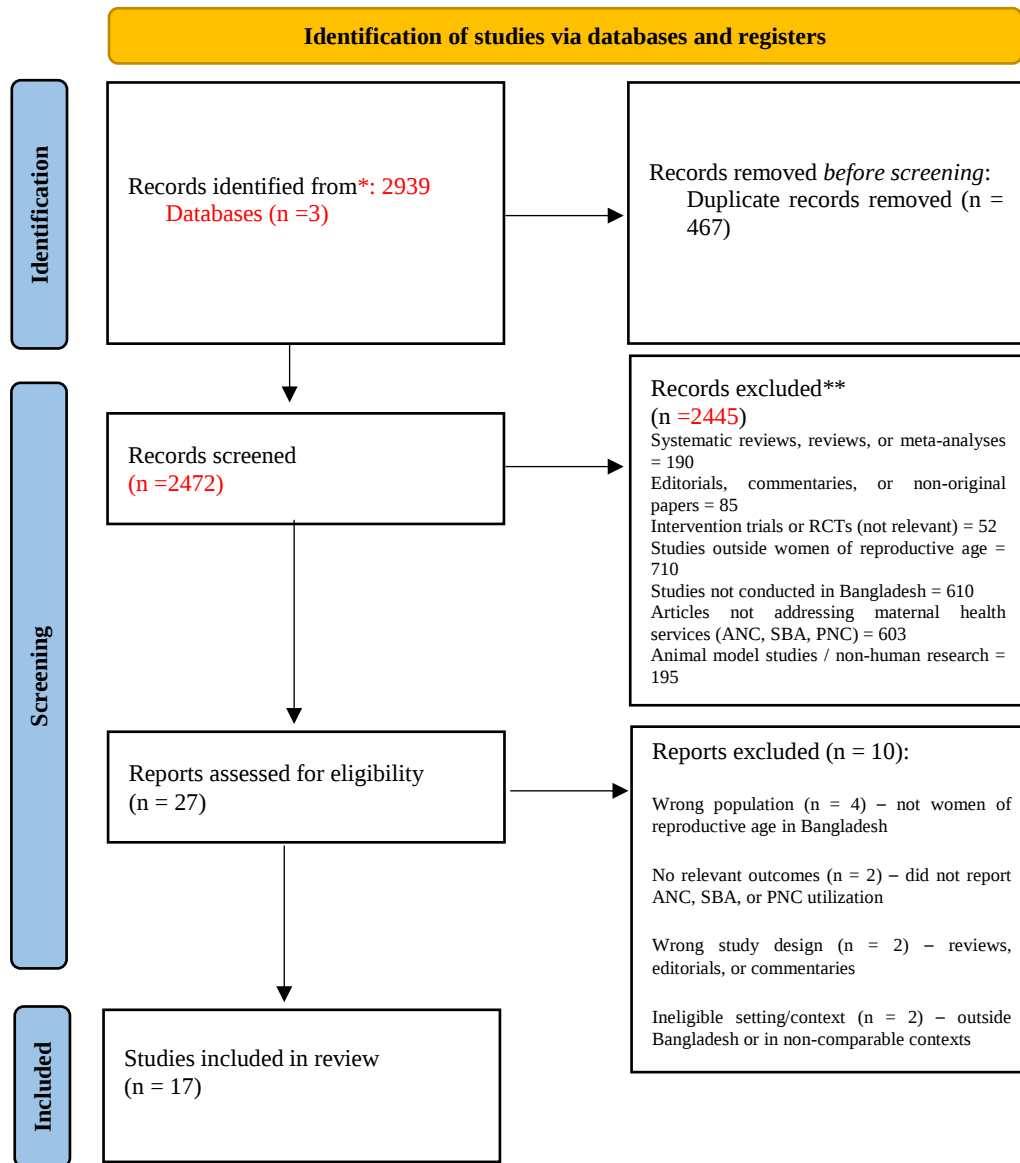
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APPENDIX

Appendix A: PRISMA Flow Chart



Appendix B: JBI Critical Appraisal for Cross-Sectional Studies

1. Were the criteria for inclusion in the sample clearly defined?
2. Were the study subjects and the setting described in detail?
3. Was the exposure measured in a valid and reliable way?
4. Were objective, standard criteria used for measurement of the condition?
5. Were confounding factors identified?
6. Were strategies to deal with confounding factors stated?
7. Were the outcomes measured in a valid and reliable way?
8. Was appropriate statistical analysis used?

Study (Author, Year)	1. Inclusion criteria defined	2. Subjects & setting described	3. Exposure measured validly	4. Standard criteria used	5. Confounding factors identified	6. Strategies for confounding	7. Outcomes measured validly	8. Appropriate statistical analysis	Score (0–8)
Kabir, 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Akter, 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Billah,	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

2022									
Khan, 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Chanda, 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Abedin, 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Begum, 2023	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Mistry, 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Rahman, 2024	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Ali, 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Nizum, 2023	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Farah,	Yes	Yes	Yes	Yes	Unclear	No	Yes	Yes	6

2015									
Alam, 2025	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Al- Mamun, 2025	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Gopalan et al., 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Appendix C: JBI Critical Appraisal for Qualitative Studies

For **qualitative studies**, the **JBI Critical Appraisal Checklist for Qualitative Research** has **10 questions**:

1. Is there congruity between the stated philosophical perspective and the research methodology?
2. Is there congruity between the research methodology and the research question or objectives?
3. Is there congruity between the research methodology and the methods used to collect data?
4. Is there congruity between the research methodology and the representation and analysis of data?
5. Is there congruity between the research methodology and the interpretation of results?
6. Is there a statement locating the researcher culturally or theoretically?
7. Is the influence of the researcher on the research, and vice-versa, addressed?
8. Are participants, and their voices, adequately represented?
9. Is the research ethical according to current criteria or is there evidence of ethical approval by an appropriate body?
10. Do the conclusions drawn in the research report flow from the analysis or interpretation of the data?

Study (Author, Year)	1. Congruity: philosophy & methodology	2. Congruity: methodology & research question	3. Congruity: methodology & data collection	4. Congruity: methodology & analysis	5. Congruity: methodology & interpretation	6. Researcher's position stated	7. Researcher influence addressed	8. Participants' voices represented	9. Ethical approval reported	10. Conclusions flow from data	Score (0– 10)
Shah et al., 2020	Yes	Yes	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	8/10

Appendix D: Rayyan Screenshots

Data Summary

Imported References	Total Duplicates	Unresolved	Resolved	453
2,939	920	0	Not Duplicate	0
Add References	Detect Duplicates	Continue Resolving	Deleted	467

Maternal Healthcare Utilization in Bangladesh

Overview | **Review Data** | Screening | Full Text Screening | Data Extraction

Imported References

All References 2,939

2...txt	1	Delete
5...txt	1	Delete
6...txt	1	Delete
8...txt	1	Delete
4.txt	1	Delete

[Add References](#)

Possible Duplicates

Unresolved	0
Deleted	467
Not Duplicate	0
Resolved	453

Maternal Healthcare Utilization in Bangladesh:

Overview | Review Data | Screening | **Full Text Screening** | Data Extraction

Showing 0 / 27 Undecided Articles

4hrs | 9mins | 16 Sessions

Filter by Inclusion

All Articles	27
Undecided	0
Excluded	10
Maybe	0
Included	17

Well Done!
There are no articles left undecided!

[View All Articles](#)

Filters

Keywords for include

- ☐ Select All
- ☐ Survey
- ☐ cross-sectional
- ☐ prevalence
- ☐ compared with
- ☐ Cohort
- ☐ Observational
- ☐ longitudinal
- ☐ randomised
- ☐ Case Control

Maternal Healthcare Utilization in Bangladesh:

Overview | Review Data | **Screening** | Full Text Screening | Data Extraction

Showing 0 / 2,472 Undecided Articles

4hrs | 9mins | 16 Sessions

Filter by Inclusion

All Articles	2,472
Undecided	0
Excluded	2,445
Maybe	0
Included	27

Filters

Keywords for include

- ☐ Select All
- ☐ Survey
- ☐ cross-sectional
- ☐ prevalence
- ☐ compared with
- ☐ Cohort
- ☐ Observational
- ☐ longitudinal
- ☐ randomised
- ☐ Case Control

Appendix E: Searching Screenshots

The screenshots show the University of Greenwich search interface, which includes a sidebar with navigation links and a main search area. The search area is titled "Search articles, books, journals & more" and features a search bar, filters, and a search button.

Search Interface Components:

- Search Bar:** Displays the search query and the selected search engine (CINAHL Plus with Full Text).
- Filters:** Includes "Limit your results" with checkboxes for "Full Text" and "Peer Reviewed".
- Search Options:** Includes "Add row", "Delete row", "Clear all", and "Search" buttons.
- Navigation Links:** Includes "My dashboard", "Projects", "Saved", "Recent activity", "Alerts", "Research tools", "New search", "Publication Finder", "Help", "Publications authority", and "CINAHL Headings".

Screenshot 1 (Top): The search query is "women or female or mothers or bangladesh". The search engine is "CINAHL Plus with Full Text". The search options are "All fields".

Screenshot 2 (Middle): The search query is "women or mothers or reproductive age or pregnant women or Bangladesh". The search engine is "CINAHL Plus with Full Text". The search options are "All fields".

Screenshot 3 (Bottom): The search query is "women or female or mothers or reproductive age or pregnant women or bangladesh". The search engine is "CINAHL Plus with Full Text". The search options are "All fields".

