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Maternal and Fetal Outcomes in Women With Preeclampsia: A Narrative Review

Kalyani Rath [1], Suhana Parween [1], Rojalin Dash [1], Anasuya Behera [1]

1. Department of Obstetrics and Gynecological Nursing, Kalinga Institute of Nursing Sciences, Kalinga Institute of Industrial Technology (Deemed to Be University), Bhubaneswar, IND

Corresponding author: Suhana Parween, parweensuhana527@gmail.com

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Abstract

Preeclampsia is a multisystem hypertensive disorder of pregnancy and remains a leading cause of maternal and perinatal morbidity and mortality, particularly in South Asia. This narrative review aimed to synthesize the evidence on maternal and fetal outcomes in women with preeclampsia, with particular reference to India and South Asia, and to describe the outcomes reported across the eight South Asian countries. PubMed/MEDLINE was searched for observational studies published between January 2011 and July 2026, with a separate search for each South Asian country. Because of marked heterogeneity, the findings were summarized narratively without statistical pooling, and selected outcome proportions were reported with 95% confidence intervals. Seventeen observational studies were included, 15 of which were from South Asia. Preeclampsia was associated with eclampsia, hemolysis, elevated liver enzymes, and low platelet count syndrome, placental abruption, acute kidney injury, and maternal death, as well as with preterm birth, fetal growth restriction, stillbirth, and perinatal death. The risk increased with disease severity and earlier onset. South Asian studies reported high rates of maternal death and stillbirth among women with eclampsia. No eligible study was identified from Sri Lanka or the Maldives. Poor outcomes in the region appeared to be associated with late antenatal booking, delayed referral, and inconsistent use of proven interventions, although the evidence is mainly from heterogeneous hospital-based studies. Strengthening antenatal coverage, timely referral, and the nursing workforce may help reduce preventable maternal and perinatal deaths.

Categories: Obstetrics/Gynecology, Public Health, Epidemiology/Public Health
Keywords: eclampsia, hellp syndrome, india, maternal outcome, nursing care, perinatal outcome, preeclampsia, preterm birth, south asia, stillbirth

Introduction And Background

Preeclampsia is a multisystem disorder characterized by new-onset hypertension (⩾140/90 mmHg) after 20 weeks of gestation, accompanied by proteinuria, maternal organ dysfunction, or placental dysfunction such as fetal growth restriction [1,2]. Eclampsia is the occurrence of new-onset generalized tonic-clonic seizures in a woman with preeclampsia [1]. Other severe complications include hemolysis, elevated liver enzymes, and low platelet count (HELLP) syndrome and posterior reversible encephalopathy syndrome (PRES), a neurological complication that may occur in women with severe preeclampsia, eclampsia, or HELLP syndrome, including in the early puerperium, and that requires prompt brain imaging and multidisciplinary management [3]. It is estimated that 76,000 women and 500,000 babies die from preeclampsia each year worldwide, and women in low-resource countries are at higher risk [2]. Hypertensive disorders of pregnancy account for 14.0% of maternal deaths, second only to hemorrhage [4]. Preeclampsia is classified as early-onset or late-onset, using 34 weeks of gestation as the cutoff. Early-onset preeclampsia carries a much higher risk of maternal and perinatal complications [2].

Clinical manifestations range from hypertension and proteinuria alone to life-threatening complications and death [5,6]. In a World Health Organization (WHO) survey of 29 countries, women with preeclampsia were eight times more likely than women without the disease to develop a life-threatening complication [7]. In 40 low- and middle-income countries, hemorrhage and hypertensive disorders together caused about one-third of maternal deaths in health facilities [8]. In India, the burden of preeclampsia remains high, and its maternal and perinatal outcomes are influenced by uneven access to health facilities, antenatal coverage, and referral services [9]. South Asian origin is also a recognized risk factor [2]. However, the evidence from South Asia is scattered across single-center, hospital-based studies from individual countries, and few reviews have brought together maternal and fetal outcomes country by country for the region. This gap makes it difficult for clinicians, nurses, and program planners to see where outcomes are poorest and which gaps in care are shared across countries, and it provides the rationale for the present review.

The primary objective of this review is to synthesize the evidence on maternal and fetal outcomes in women with preeclampsia, with particular reference to India and South Asia. The secondary objective is to describe the outcomes reported across the eight South Asian countries and to identify any regional pattern. The regional comparison was descriptive: the included studies were tabulated by country and setting, and the

ranges of the reported outcome frequencies were compared, without statistical pooling.

Review

Methodology

Criteria for Considering Studies

Studies were included if they 1) were observational studies with a cross-sectional, case-control, cohort, or case-series design; 2) included pregnant or postpartum women diagnosed with preeclampsia, eclampsia, or HELLP syndrome; 3) reported at least one of the maternal, fetal, or perinatal outcomes listed below; 4) were published between January 2011 and July 2026; and 5) were available in full text. Studies were excluded if they were case reports, editorials, letters, or reviews; if outcomes were not reported separately for women with preeclampsia; or if the full text was not available. The participants were pregnant and postpartum women diagnosed with preeclampsia, and their fetuses and neonates. The maternal outcomes of interest were eclampsia, HELLP syndrome, placental abruption, acute kidney injury (AKI), disseminated intravascular coagulation, stroke, cesarean delivery, postpartum hemorrhage, intensive care admission, and maternal death. The fetal and perinatal outcomes were preterm birth, fetal growth restriction, low birth weight, birth asphyxia, neonatal intensive care unit (NICU) admission, stillbirth, and perinatal death. Two studies from sub-Saharan Africa that were identified through reference lists and met these criteria were retained for comparison with another low-resource region.

Definitions

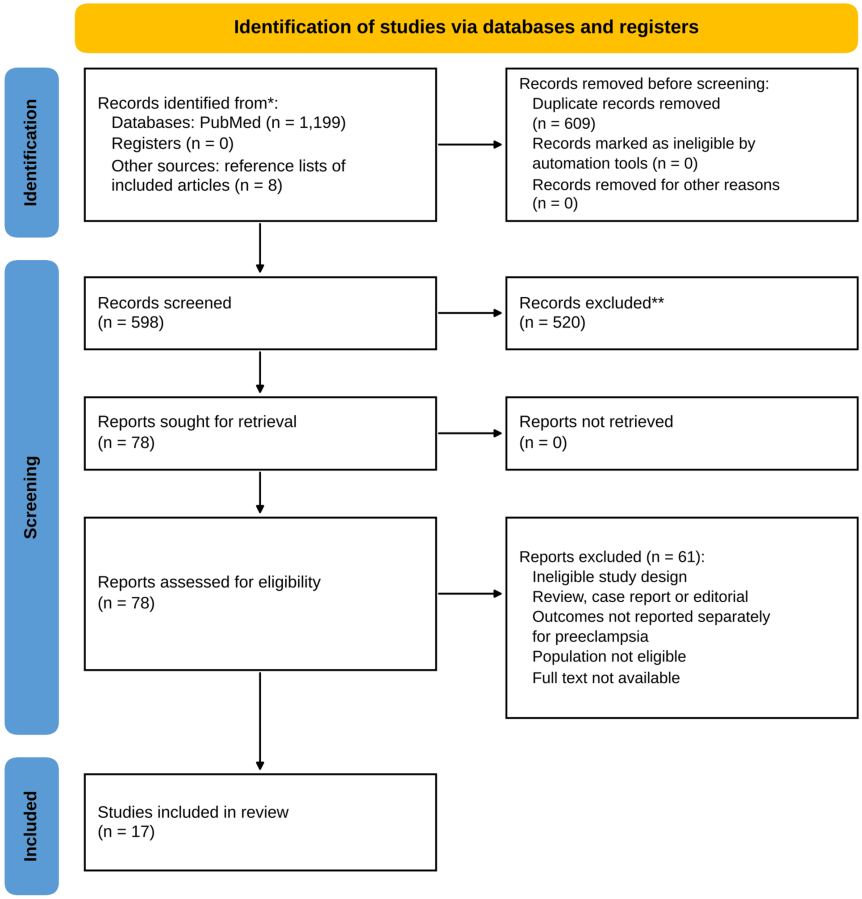
Preeclampsia was defined as new-onset hypertension (systolic blood pressure ⩾140 mmHg or diastolic blood pressure ⩾90 mmHg) after 20 weeks of gestation with proteinuria or maternal organ or uteroplacental dysfunction, and preeclampsia with severe features as severe hypertension (⩾160/110 mmHg) or maternal end-organ involvement [1,6]. Early-onset and late-onset preeclampsia were defined as onset before and at or after 34 weeks of gestation, respectively [2]. Eclampsia was defined as new-onset generalized tonic-clonic seizures in a woman with preeclampsia [1]. Preterm birth was defined as birth before 37 completed weeks of gestation, low birth weight as a birth weight below 2,500 g, fetal growth restriction as an estimated fetal weight or birth weight below the 10th centile for gestational age, stillbirth as fetal death at or after 28 weeks of gestation, and perinatal death as stillbirth or early neonatal death within seven days of birth. Where an included study used a different definition, the definition of the original authors was accepted, and the outcome was reported as described in that study.

Search Strategy

PubMed/MEDLINE was searched from January 2011 to July 2026. The search combined three groups of terms with the Boolean operator AND: 1) terms for the condition ("pre-eclampsia"[MeSH Terms] OR preeclampsia[tiab] OR pre-eclampsia[tiab] OR eclampsia[tiab] OR "HELLP syndrome"[tiab]); 2) terms for outcomes (outcome*[tiab] OR complication*[tiab] OR mortality[tiab] OR morbidity[tiab] OR stillbirth[tiab] OR preterm[tiab] OR perinatal[tiab] OR "maternal death"[tiab]); and 3) the names of the eight South Asian countries. A separate search was then conducted for each country by replacing the third group with the name of that country (MeSH term and free text). The country-specific search strings are provided in the Appendix. The reference lists of the included articles were also searched manually. In addition, landmark randomized trials, systematic reviews, and international guidelines, including those of the WHO [10], were consulted to describe the burden, pathophysiology, prediction, prevention, and management of preeclampsia.

Study Selection and Data Extraction

The PubMed searches (the combined search and eight country-specific searches) retrieved 1,199 records. All 609 records retrieved by the country-specific searches were also retrieved by the combined search and were removed as duplicates, leaving 590 records. Eight further records were identified from the reference lists of included articles. The titles and abstracts of 598 records were screened, and 520 were excluded. The full texts of 78 articles were assessed against the eligibility criteria by two reviewers independently. Disagreements were resolved by discussion, and a third reviewer was consulted when agreement could not be reached. Of the 78 articles, 61 were excluded, and 17 observational studies met the eligibility criteria (Figure *1*). The selection process is reported following the PRISMA 2020 statement [11]. Disagreements were resolved by discussion, and a third reviewer was consulted when agreement could not be reached. Of these, 15 were from South Asia: eight from India, one from Pakistan, two from Bangladesh, two from Nepal, one from Afghanistan, and one from Bhutan. No eligible study was identified from Sri Lanka or the Maldives. Data on the study design, setting, sample size, and outcomes were extracted by one reviewer using a structured form and checked by a second reviewer, and are summarized in Table *1*.



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

FIGURE 1: PRISMA 2020 flow diagram of study selection

Source: [11]

Country (setting)	Study (year)	Design and sample	Key maternal outcomes	Key fetal/perinatal outcomes
India (South India)	Gangadhar et al. (2023) [12]	Prospective; 145 women with severe preeclampsia <28 weeks	≥1 major complication 29.7%; HELLP syndrome 16.6%; eclampsia 8.3%	Stillbirth 68.7%; 17.0% of live-born infants survived to 28 days
India (New Delhi)	Sharma et al. (2023) [13]	Prospective cohort; 256 women with preeclampsia	Maternal complications 39.5%	Fetal complications 46.9%
India (Odisha)	Moharana et al. (2023) [14]	Cross-sectional; 1,200 women with preeclampsia	LDH and uric acid rise with severity	More fetal complications in severe disease
India (Maharashtra)	Deshmukh et al. (2022) [15]	Prospective; 63 women with eclampsia and PRES	HELLP syndrome 19.0%; placental abruption 11.1%	NICU admission 41.3%; neonatal death 6.3%
India (Odisha)	Mohapatra et al. (2022) [16]	Retrospective; preterm births, tertiary hospital	Preeclampsia is a leading cause of planned preterm birth	Neonatal death 9.2%; birth asphyxia the commonest cause
India (West Bengal)	Chaudhuri et al. (2021) [17]	Observational; 182 women with eclampsia ≥34 weeks	Severe maternal complications more frequent after planned vaginal delivery	Perinatal death 25.8% (planned vaginal) vs. 8.3% (planned cesarean)
India (Karnataka)	Bargunam et al. (2023) [18]	Observational; 87 hypertensive vs. 88 normotensive placentae	Placental changes increase with severity	Fetal death and fetal growth restriction rise with severity
India (Chandigarh)	Wadhwani et al. (2020) [19]	Comparative; 150 early-onset vs. 150 late-onset preeclampsia	Placental abruption 16.0% vs. 7.3%	Poorer perinatal outcomes in early-onset preeclampsia
Pakistan (Karachi)	Islam et al. (2025) [20]	Cross-sectional; 324 women with preterm preeclampsia	Serious maternal complications 13.9%	Intrauterine death 5.6%; neonatal death 6.3%
Bangladesh (Tangail)	Parna et al. (2013) [21]	Cross-sectional; 100 women with eclampsia	Complications 30%; maternal death 9%	Stillbirth 13%; low birth weight 66%
Bangladesh (Dhaka)	Talukder et al. (2019) [22]	Prospective; 100 women with eclampsia	Pulmonary edema 41%; renal failure 6%; maternal death 4%	Perinatal deaths 29 of 100; no difference by gravidity
Nepal (Biratnagar)	Ghimire (2016) [23]	Retrospective; 112 women with eclampsia among 8,066 deliveries	>90% unbooked; maternal death 5.36%	Perinatal death 9%
Nepal (Dharan)	Pradhan et al. (2019) [24]	Prospective; 52 women with eclampsia	31 women required ventilation	Low birth weight 57.6%; stillbirth 21.1%
Afghanistan (Kabul)	Frotan Yosufi et al. (2026) [25]	Retrospective case series; 26 women with HELLP syndrome	DIC 19.2%; renal failure 15.4%; maternal death 7.7%	Not reported
Bhutan (Thimphu)	Gyamtsho et al. (2024) [26]	Case-control; 107 preterm births vs. 201 controls	Not reported	Preeclampsia is the strongest risk factor for preterm birth (aOR 10.99)
Ethiopia (Addis Ababa)	Belay Tolu et al. (2020) [27]	Prospective; 164 women with preeclampsia without severe features	Maternal complication 31.7%; progression to severe preeclampsia 19.5%	Perinatal risk 25.9 times higher in early-onset preeclampsia
Malawi (Blantyre)	Cooke et al. (2018) [28]	Prospective; 322 high-risk obstetric admissions	Preeclampsia caused 73.1% of AKI; full recovery 84.6%	Perinatal mortality 13.8%

TABLE 1: Maternal and fetal outcomes in the included studies, by country and setting

aOR: adjusted odds ratio; AKI: acute kidney injury; DIC: disseminated intravascular coagulation; HELLP: hemolysis, elevated liver enzymes, and low platelet count; LDH: lactate dehydrogenase; NICU: neonatal intensive care unit; PRES: posterior reversible encephalopathy syndrome

Quality Appraisal and Synthesis

Because this was a narrative review, a formal risk-of-bias assessment with a validated tool was not

performed. To limit bias in interpretation, the design features that are most likely to affect the validity of the findings (study design, single-center or multicenter setting, sample size, and whether the population was hospital-based) were recorded for each study, are reported in Table 1, and were taken into account when the findings were interpreted. A meta-analysis was not performed because of marked clinical and methodological heterogeneity in the populations, definitions of severity, and outcome measures. The findings were therefore synthesized narratively and grouped by outcome and by country. For selected outcomes for which the number of events could be derived from the reported percentage and denominator, the proportions were recalculated with 95% confidence intervals (CIs) using the Wilson score method (Table 2) [29].

Country (setting)	Study (year)	Outcome	Events/total (n/N)	Percentage (95% CI)
India (South India)	Gangadhar et al. (2023) [12]	At least one major maternal complication	43/145	29.7 (22.8-37.5)
		HELLP syndrome	24/145	16.6 (11.4-23.4)
		Eclampsia	12/145	8.3 (4.8-13.9)
India (New Delhi)	Sharma et al. (2023) [13]	Maternal complications	101/256	39.5 (33.7-45.6)
		Fetal complications	120/256	46.9 (40.9-53.0)
India (Maharashtra)	Deshmukh et al. (2022) [15]	HELLP syndrome	12/63	19.0 (11.2-30.4)
		Placental abruption	7/63	11.1 (5.5-21.2)
		NICU admission	26/63	41.3 (30.0-53.6)
		Neonatal death	4/63	6.3 (2.5-15.2)
India (Chandigarh)	Wadhwani et al. (2020) [19]	Placental abruption, early onset	24/150	16.0 (11.0-22.7)
		Placental abruption, late onset	11/150	7.3 (4.1-12.7)
Pakistan (Karachi)	Islam et al. (2025) [20]	Serious maternal complications	45/324	13.9 (10.5-18.1)
		Intrauterine death	18/324	5.6 (3.5-8.6)
Bangladesh (Tangail)	Parna et al. (2013) [21]	Maternal death	9/100	9.0 (4.8-16.2)
		Stillbirth	13/100	13.0 (7.8-21.0)
		Low birth weight	66/100	66.0 (56.3-74.5)
Bangladesh (Dhaka)	Talukder et al. (2019) [22]	Maternal death	4/100	4.0 (1.6-9.8)
		Pulmonary edema	41/100	41.0 (31.9-50.8)
		Perinatal death	29/100	29.0 (21.0-38.5)
Nepal (Biratnagar)	Ghimire (2016) [23]	Maternal death	6/112	5.4 (2.5-11.2)
Afghanistan (Kabul)	Frotan Yosufi et al. (2026) [25]	Maternal death	2/26	7.7 (2.1-24.1)
		DIC	5/26	19.2 (8.5-37.9)
		Renal failure	4/26	15.4 (6.2-33.5)
Ethiopia (Addis Ababa)	Belay Tolu et al. (2020) [27]	Any maternal complication	52/164	31.7 (25.1-39.2)
		Progression to severe preeclampsia	32/164	19.5 (14.2-26.2)

TABLE 2: Selected maternal and fetal outcomes in the included studies, with 95% CIs

Numbers of events were derived from the percentages and denominators reported in each study; 95% CIs were calculated using the Wilson score method [29]

CI: confidence interval; DIC: disseminated intravascular coagulation; HELLP: hemolysis, elevated liver enzymes, and low platelet count; NICU: neonatal intensive care unit

Burden and risk factors

Globally, the number of incident cases of hypertensive disorders of pregnancy rose from 16.30 million in 1990 to 18.08 million in 2019. Although the age-standardized incidence rate declined slightly over this period, incidence and mortality remained highest in countries with a low sociodemographic index [30]. In India, an analysis of National Family Health Survey-4 data on 32,428 currently pregnant women found hypertension in 6.1% of women who did not use tobacco and in 7.5% of tobacco users, and the odds of hypertension were higher among older and rural women [31]. These figures suggest that hypertension affects a substantial number of pregnant women in India.

Several clinical risk factors can be identified at the first antenatal visit. In a meta-analysis of 92 cohort studies including more than 25 million pregnancies, previous preeclampsia carried the greatest pooled relative risk (RR) of preeclampsia (8.4), followed by chronic hypertension (RR 5.1), pregestational diabetes (RR 3.7), prepregnancy body mass index above 30 kg/m^2 (RR 2.8), and assisted reproduction (RR 1.8), whereas antiphospholipid antibody syndrome had the highest absolute rate of preeclampsia (17.3%) [32]. Assessment of these factors at booking forms the basis of risk-based aspirin prophylaxis [2,32].

Pathophysiology

Preeclampsia is a disorder of the placenta. Its systemic features arise from soluble factors released by a stressed syncytiotrophoblast. Early-onset disease is thought to result from defective placentation, whereas late-onset disease may reflect an interaction between normal placental aging and a maternal predisposition to cardiovascular and metabolic disease [33]. A key mechanism is an imbalance between antiangiogenic and proangiogenic factors. In a nested case-control study, serum soluble fms-like tyrosine kinase 1 (sFlt-1) began to rise about five weeks before the onset of preeclampsia, and placental growth factor (PlGF) was already lower from 13 to 16 weeks of gestation; these changes were greater in early-onset disease and when the infant was small for gestational age [34]. This shared placental origin may explain why maternal endothelial injury and fetal growth restriction so often occur together [33,35].

Maternal outcomes

Preeclampsia affects all maternal organ systems. The main complications include eclampsia, HELLP syndrome, placental abruption, AKI, pulmonary edema, stroke, postpartum hemorrhage, and maternal death [5,6]. These complications are more frequent with severe disease, early onset, and delayed access to care. HELLP syndrome should be distinguished from acute fatty liver of pregnancy (AFLP), which also presents in late pregnancy with abdominal pain, liver dysfunction, and coagulopathy. AFLP may progress rapidly to multiorgan failure; it is diagnosed using the Swansea criteria, which include hypoglycemia, encephalopathy, and raised ammonia, and it requires supportive care and prompt delivery [36].

Eclampsia is one of the most serious complications, and uncontrolled severe hypertension may lead to fatal intracranial hemorrhage [6]. In Odisha, high serum lactate dehydrogenase and uric acid levels were associated with disease severity and complications among 1,200 women [14]. In Maharashtra, among 63 women with eclampsia and PRES, HELLP syndrome occurred in 19.0% and placental abruption in 11.1%; headache and visual disturbance were the most common warning symptoms [15].

In South India, among 145 women with severe preeclampsia before 28 weeks, HELLP syndrome was the most common complication (16.6%), followed by eclampsia (8.3%), and 29.7% had at least one major complication [12]. In Chandigarh, placental abruption was twice as common in early-onset as in late-onset preeclampsia (16.0% vs. 7.3%) [19]. In New Delhi, 39.5% of 256 women developed a maternal complication [13].

In Malawi, preeclampsia caused 73.1% of AKI among high-risk obstetric admissions; however, 84.6% of affected women recovered fully with specialist care [28]. This finding suggests that outcomes may depend on the quality of available care. Preeclampsia without severe features also carries risk: in Ethiopia, 31.7% of 164 women developed a complication, and 19.5% progressed to severe preeclampsia [27]. In addition, women with a history of preeclampsia have a higher lifetime risk of chronic hypertension, heart disease, stroke, and kidney disease [2,35].

The consequences of preeclampsia extend beyond pregnancy. A meta-analysis of 22 studies including more than 6.4 million women found that preeclampsia was independently associated with a fourfold increase in future heart failure (RR 4.19) and an approximately twofold increase in coronary heart disease (RR 2.50), stroke (RR 1.81), and cardiovascular death (RR 2.21) [37]. These findings support structured postpartum follow-up and lifelong monitoring of cardiovascular risk factors in women with a history of preeclampsia [37].

Preeclampsia is also one of the risk factors included in the Royal College of Obstetricians and Gynecologists (RCOG) score for venous thromboembolism (VTE) before delivery. Coagulation markers such as D-dimer and soluble fibrin monomer complex have been studied for VTE risk assessment in late pregnancy; however, in a study of 100 third-trimester pregnancies, their concentrations did not differ between women at low and

high RCOG risk, which suggests that these tests should be interpreted individually alongside clinical risk assessment [38].

Fetal and perinatal outcomes

Preeclampsia affects the fetus in two ways. First, poor placental blood flow restricts fetal growth and oxygen supply. Second, early delivery is often required to protect the mother [39]. Preterm birth is the most common adverse outcome, and it is often planned for medical reasons rather than spontaneous [5]. In eastern India, preeclampsia was significantly associated with planned preterm birth, and birth asphyxia was the leading cause of neonatal death [16]. In Karnataka, fetal death and fetal growth restriction increased with the severity of maternal hypertension [18]. In New Delhi, 46.9% of pregnancies had a fetal complication [13], and in Maharashtra, 41.3% of neonates required NICU admission and 6.3% died [15].

Gestational age at onset is a strong predictor of fetal outcome. In women with severe preeclampsia before 28 weeks whose pregnancies were prolonged, the stillbirth rate was 68.7%, and only 17.0% of live-born neonates survived to 28 days [12]. Early-onset preeclampsia was associated with significantly poorer perinatal outcomes than late-onset preeclampsia [19], and in Ethiopia, the risk of perinatal complications was 25.9 times higher in early-onset disease [27]. In West Bengal, among women with eclampsia beyond 34 weeks, perinatal death was more frequent after planned vaginal delivery than after planned cesarean delivery (25.8% vs. 8.3%) [17].

Maternal and fetal outcomes across South Asia

Table *1* summarizes the included studies by country. In Pakistan, among 324 women with preterm preeclampsia, serious maternal complications occurred in 13.9%, intrauterine death in 5.6%, and neonatal death in 6.3% [20]. In Bangladesh, two studies, each of 100 women with eclampsia, reported maternal death in 9% and 4%; in the first study, stillbirth occurred in 13% and low birth weight in 66% [21,22]. In Nepal, more than 90% of 112 affected women had no antenatal booking, and maternal death occurred in 5.36% [23]. Another Nepalese study reported stillbirth in 21.1% and low birth weight in 57.6%, and mortality was related to the delay in administering magnesium sulfate [24]. In Afghanistan, among 26 women with HELLP syndrome, maternal death occurred in 7.7% [25]. In Bhutan, preeclampsia was the strongest maternal risk factor for preterm birth (adjusted odds ratio (aOR): 10.99) [26].

Taken together, these studies suggest a broadly similar regional pattern (Tables *1*, *2*). However, comparisons between countries should be interpreted with caution because the studies differed in design, populations, disease severity, and outcome definitions. Among the South Asian studies of women with eclampsia, maternal death ranged from 4% to 9%, stillbirth from 13% to 21%, and low birth weight from 57% to 66%. The Nepalese findings suggest that poor outcomes may be associated with late or absent antenatal care; however, a causal relationship cannot be established from these descriptive data. No eligible study was found from Sri Lanka or the Maldives, and the evidence from Bhutan and Afghanistan was limited. Thus, the regional evidence is mainly based on Indian studies.

Prediction and early detection

Screening based on maternal history alone performs poorly. In a multicenter study of 8,775 singleton pregnancies, an algorithm combining maternal factors, mean arterial pressure, uterine artery pulsatility index, and serum PlGF at 11-13 weeks detected 100% of cases of preeclampsia requiring delivery before 32 weeks and 75% of those requiring delivery before 37 weeks at a 10% false-positive rate, compared with 41% and 39%, respectively, using National Institute for Health and Care Excellence criteria [40]. Later in pregnancy, among women with suspected preeclampsia between 24 and 37 weeks, an sFlt-1:PlGF ratio of 38 or lower had a negative predictive value of 99.3% for the development of preeclampsia within the following week [41]. Such tests can reduce unnecessary admissions and target surveillance. However, they require ultrasound expertise and laboratory capacity that are not available in many district and primary care facilities, and accurate blood pressure measurement and urine testing remain the basis of detection in most low-resource settings [2].

Management of preeclampsia

The key elements of management are control of blood pressure, prevention of seizures, and timely delivery [6,42]. Women at high risk should receive low-dose aspirin (approximately 150 mg at night) from 11-14 weeks until 36 weeks, which reduced preterm preeclampsia from 4.3% to 1.6% in a large trial [2,43]. The WHO recommends low-dose aspirin for women at high risk and calcium supplementation in populations with low dietary calcium intake [10]. In women with low dietary calcium intake, a single daily dose of 500 mg calcium was as effective as the standard 1,500 mg dose [44]. Severe hypertension requires urgent treatment with labetalol, nifedipine, or hydralazine [6,45]. Magnesium sulfate is the drug of choice for preventing and treating eclampsia and should be administered without delay [1,10,24]. Antenatal corticosteroids reduced neonatal death in low-resource countries [46], and planned delivery from 34 weeks reduced stillbirth in India and Zambia [47]. After delivery, women should be counseled about their long-term cardiovascular risk [2].

These recommendations are supported by large randomized trials and meta-analyses. In the Magpie trial of

10,141 women in 33 countries, magnesium sulfate reduced the risk of eclampsia by 58% compared with placebo (0.8% vs. 1.9%) and probably reduced maternal death (RR, 0.55; 95% CI, 0.26-1.14), without substantive short-term harm to the mother or baby [48]. For aspirin, a meta-analysis of 16 trials including 18,907 women showed that the reduction in preterm preeclampsia was confined to treatment started at or before 16 weeks at a daily dose of at least 100 mg (RR, 0.33; 95% CI, 0.19-0.57), with no significant effect on term preeclampsia [49]. In a Cochrane review, high-dose calcium supplementation (at least 1 g daily) reduced the risk of preeclampsia by more than half (RR, 0.45; 95% CI, 0.31-0.65), with the clearest benefit in women with low dietary calcium intake [50], a group that includes many pregnant women in India [44].

Trials have also clarified blood pressure targets and the timing of delivery. In the Control of Hypertension in Pregnancy Study of 987 women with nonproteinuric preexisting or gestational hypertension, tight control (target diastolic pressure 85 mmHg) did not increase pregnancy loss or high-level neonatal care compared with less-tight control (target 100 mmHg), and severe maternal hypertension was less frequent (27.5% vs. 40.6%) [51]. In the Chronic Hypertension and Pregnancy trial of 2,408 women with mild chronic hypertension, treatment to a target below 140/90 mmHg reduced a composite of preeclampsia with severe features, medically indicated preterm birth before 35 weeks, placental abruption, and fetal or neonatal death (30.2% vs. 37.0%) without increasing small-for-gestational-age births [52]. At term, induction of labor in women with gestational hypertension or mild preeclampsia beyond 36 weeks reduced poor maternal outcomes from 44% to 31% [53]. In late preterm preeclampsia (34 to less than 37 weeks), planned delivery reduced maternal morbidity or severe hypertension (65% vs. 75%) but increased the composite of perinatal death or neonatal unit admission (42% vs. 34%), so the decision must balance maternal and neonatal risks [54].

Why preeclampsia has not been eliminated

The cause of preeclampsia is not fully understood, and no treatment reverses the underlying placental changes [35,55]. However, much of the potentially preventable harm appears to be related to gaps in care. First-trimester screening requires laboratory tests and trained staff that are not available in many South Asian facilities, and preventive aspirin depends on early antenatal booking [2,23]. Magnesium sulfate is still underused because of limited provider confidence, supply problems, and weak referral systems [56]. Moreover, access to essential treatments does not improve survival unless it is supported by good-quality emergency care [57].

Health-system interventions in low-resource settings

Interventions to improve detection and referral have been tested in South Asia. The Community-Level Interventions for Pre-eclampsia trials in India, Pakistan, and Mozambique, which included 69,330 pregnancies, used community health workers supported by mobile health tools to detect hypertension, start treatment, and refer women to facilities. However, the composite of maternal or perinatal death or severe morbidity was not reduced (24% vs. 22%; aOR, 1.17; 95% CI, 0.90-1.51), and the investigators recommended expanding the community health workforce and strengthening the wider health system [58]. In the CRADLE-3 stepped-wedge trial, conducted in Africa, India, and Haiti, introduction of a vital-sign alert device with training was followed by an 8% fall in the composite of eclampsia, emergency hysterectomy, and maternal death, although this reduction could not be attributed directly to the intervention [59]. Together, these findings suggest that single interventions are unlikely to succeed unless they are part of functioning referral systems with good-quality facility care [57].

Implications for nursing practice

Nurses and midwives are often the first point of contact for pregnant women and are therefore well placed to identify preeclampsia early. Their key roles include early risk assessment and antenatal booking, accurate measurement of blood pressure and urinary protein, use of early-warning protocols, safe administration of magnesium sulfate, education on warning signs, and postnatal follow-up [15,56,60]. An early-warning tool reduced the incidence of eclampsia by 45.4% at an Indian referral center [60].

Limitations

This review has several limitations. First, the primary database search was restricted to PubMed/MEDLINE, and other databases such as Embase, Scopus, Cumulative Index to Nursing and Allied Health Literature, and regional databases were not searched; relevant studies, particularly from countries with limited indexing, may therefore have been missed. Second, a formal risk-of-bias assessment with a validated tool was not performed, in keeping with the narrative design, so the quality of the individual studies was considered only through their design features. Third, the selection and interpretation of the evidence may be subject to selection bias, as the review did not follow the full methods of a systematic review. Fourth, the included studies differed in design, sample size, definitions of severity, and outcome measures, and most were hospital-based studies from tertiary centers, which may over-represent severe cases; for these reasons, the findings were not pooled, and cross-country comparisons should be interpreted cautiously. Fifth, the evidence from some South Asian countries was limited or absent. Finally, the review focused on South Asia, and studies from other regions, such as Southeast Asia (e.g., Vietnam, Thailand, and Indonesia), were outside its scope. Therefore, the results may not be generalizable to all settings and should be interpreted

with caution.

Conclusions

Preeclampsia remains a serious threat to both the mother and the fetus. The evidence summarized in this review shows that it is associated with eclampsia, HELLP syndrome, placental abruption, AKI, and maternal death, as well as with preterm birth, fetal growth restriction, stillbirth, and perinatal death, and that these risks are greater in severe and early-onset disease. In South Asia, the available hospital-based studies reported high frequencies of adverse outcomes, and late antenatal booking and delayed referral were associated with poorer outcomes. Because this evidence comes mainly from heterogeneous observational studies, these findings should be interpreted with caution. Improving antenatal coverage, timely referral, and the consistent use of proven interventions, supported by a skilled nursing workforce, may reduce this burden. Further multicenter studies using standard definitions are needed, particularly from Sri Lanka, the Maldives, Bhutan, and Afghanistan.

Appendices

PubMed/MEDLINE search strategies (January 2011 to July 2026)

#1 Condition terms: ("pre-eclampsia"[MeSH Terms] OR preeclampsia[tiab] OR pre-eclampsia[tiab] OR eclampsia[tiab] OR "HELLP syndrome"[tiab])

#2 Outcome terms: (outcome*[tiab] OR complication*[tiab] OR mortality[tiab] OR morbidity[tiab] OR stillbirth[tiab] OR preterm[tiab] OR perinatal[tiab] OR "maternal death"[tiab])

Each search was run as #1 AND #2 AND #3, where #3 is the country block shown below for the combined and country-specific searches.

Combined search: #3 ("India"[MeSH Terms] OR India[tiab] OR "Pakistan"[MeSH Terms] OR Pakistan[tiab] OR "Bangladesh"[MeSH Terms] OR Bangladesh[tiab] OR "Nepal"[MeSH Terms] OR Nepal[tiab] OR "Sri Lanka" [MeSH Terms] OR "Sri Lanka"[tiab] OR "Bhutan"[MeSH Terms] OR Bhutan[tiab] OR "Maldives"[MeSH Terms] OR Maldives[tiab] OR "Afghanistan"[MeSH Terms] OR Afghanistan[tiab] OR "South Asia"[tiab])

India: #3 ("India"[MeSH Terms] OR India[tiab])

Pakistan: #3 ("Pakistan"[MeSH Terms] OR Pakistan[tiab])

Bangladesh: #3 ("Bangladesh"[MeSH Terms] OR Bangladesh[tiab])

Nepal: #3 ("Nepal"[MeSH Terms] OR Nepal[tiab])

Sri Lanka: #3 ("Sri Lanka"[MeSH Terms] OR "Sri Lanka"[tiab])

Bhutan: #3 ("Bhutan"[MeSH Terms] OR Bhutan[tiab])

Maldives: #3 ("Maldives"[MeSH Terms] OR Maldives[tiab])

Afghanistan: #3 ("Afghanistan"[MeSH Terms] OR Afghanistan[tiab])

Searches were limited to publication dates from January 1, 2011, to July 31, 2026. tiab: title/abstract field

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Suhana Parween, Kalyani Rath

Acquisition, analysis, or interpretation of data: Suhana Parween, Rojalin Dash, Anasuya Behera

Drafting of the manuscript: Suhana Parween, Rojalin Dash

Critical review of the manuscript for important intellectual content: Kalyani Rath, Anasuya Behera

Supervision: Kalyani Rath

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