Volume 4, Issue 3, 2026

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

TREATMENT AND MANAGEMENT OF PRE-ECLAMPSIA AND ECLAMPSIA IN PAKISTAN: A SYSTEMATIC REVIEW OF THE LITERATURE

Dr Amna Naveed[*1], Dr Faiza[2], Dr. Hafiza Naila Marvi[3], Dr Fahma Khilji[4], Abdul Jabbar[5]

[*1]*Medical Officer*
[2]*Pg 1 gyane obs in Drs hospital*
[3]*Women Medical Officer, Fatima Jinnah Hospital, Multan*
[4]*Mbbs doctor*
[5]*Emergency Care Technologist*

[*1]amnahaider44@gmail.comb, [2]faizanaeem500@gmail.com, [3]drhafizanaila786@gmail.com, [4]z18.mbbs.446@gmail.com, [5]abduljabbarbjr2017@gmail.com

DOI: https://doi.org/10.5281/zenodo.23415505

Keywords
pre-eclampsia; eclampsia; magnesium sulphate; maternal mortality; Pakistan; systematic review

Article History
Received: 01 January 2026
Accepted: 17 March 2026
Published: 31 March 2026

Copyright @Author
Corresponding Author: *
Dr Amna Naveed

Abstract

Background: *Hypertensive disorders of pregnancy are among the main drivers of illness and death for mothers and newborns. Pre-eclampsia and eclampsia (PE/E) can largely be prevented when care is timely, yet Pakistan, one of six countries responsible for more than half of all maternal deaths worldwide, still carries a heavy burden.*

Objective: *To synthesise published evidence on the risk factors, consequences, detection, prevention and treatment of PE/E in Pakistan, with special attention to magnesium sulphate (MgSO4).*

Methods: *Seven databases (PubMed, Google Scholar, Medline/POPLINE, ScienceDirect, Cochrane, WHOLIS and EBSCO Host) were searched for peer-reviewed English-language papers from 2010 to 2025. Two reviewers independently screened titles, abstracts and full texts. Retained papers were grouped as descriptive, risk-factor, health-outcome or intervention studies.*

Results: *Of 11,766 records identified, 226 papers were kept: 147 descriptive, 20 on risk factors, 33 on other health outcomes and 26 on interventions. Reported risk factors included a first pregnancy, very young or older maternal age, twin pregnancy, diabetes, chronic hypertension, obesity, stress and poverty. Reported consequences included stillbirth, restricted fetal growth, placental abruption, acute kidney injury, HELLP syndrome and maternal death. MgSO4 is officially the first-choice drug and is part of national policy, but it is used far less than it should be because of supply failures, complicated dose preparation, inadequate training and reluctance among providers.*

Conclusions: *Pakistan's main shortfall lies in putting policy into practice. Priorities are a dependable MgSO4 supply (preferably prefilled doses), provider training, national clinical guidelines, stronger antenatal care and community-based research.*

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

1. INTRODUCTION

Roughly one in ten pregnancies worldwide is affected by a hypertensive disorder. Pre-eclampsia, defined as blood pressure of at least 140/90 mmHg together with protein in the urine after 20 weeks of gestation in a woman who was previously normotensive, occurs in about 4–8% of pregnancies. Around 10% of these cases advance to severe pre-eclampsia or eclampsia, and an estimated 10–20% of maternal deaths worldwide are linked to eclampsia. Women in low- and middle-income countries are about seven times more likely to develop pre-eclampsia than women in wealthy countries. The condition is tied to restricted fetal growth, preterm birth, and death of mothers and babies, although most of these deaths could be avoided with prompt and effective care.

Pakistan records about 8.6 million pregnancies a year. An estimated 15% of them (about 1.2 million) involve obstetric complications, and nearly 14,000 pregnancy-related deaths occur annually, equal to roughly one death every 40 minutes. The latest survey-based maternal mortality ratio (MMR), from the Pakistan Demographic and Health Survey 2006–07, was 276 per 100,000 live births. It varied widely by region, from about 227 in Punjab to 789 in Baluchistan. Model-based Global Burden of Disease estimates are higher, at 401 per 100,000 in 2014 (uncertainty range 233–560). In the 2006–07 survey, eclampsia accounted for more than 12% of direct maternal deaths, and a Population Council study in Punjab attributed slightly over a quarter of deaths to pregnancy-induced hypertension.

Counting maternal deaths accurately remains hard. Vital registration is incomplete, household surveys need very large samples, and indirect approaches such as the sisterhood method and RAMOS each have weaknesses. Since the 18th Constitutional Amendment, provinces and districts are responsible for health planning, which raises the need for reliable sub-national data. MgSO4 is the recommended drug for preventing and treating seizures in severe pre-eclampsia and eclampsia, but the evidence suggests that national policy has not been matched by practice. This review therefore examines the challenges, gaps and interventions related to preventing and treating PE/E in Pakistan.

2. Methodology

Search strategy. Original articles published between 2010 and 2025 were sought in PubMed, Google Scholar, Medline/POPLINE, ScienceDirect, Cochrane, the WHO Library Information System (WHOLIS) and all EBSCO Host databases.

Inclusion criteria. Eligible papers were peer-reviewed, written in English, concerned Pakistan, and focused on pre-eclampsia, eclampsia or hypertension in pregnancy. This included studies on MgSO4 loading doses in severe PE/E, studies of MgSO4 at community or primary-care level, aspirin prophylaxis and antihypertensive treatment.

Exclusion criteria. Documents published before 2010, those not relevant to the review aim, those with very small samples, and those that did not discuss PE/E in meaningful detail were left out.

Screening and analysis. The process had three phases:

1. *Title and abstract screening.* Two reviewers worked independently and removed abstracts that were not about Pakistan, not about pregnancy, or not about PE/E and its risk factors, symptoms or complications.
2. *Full-text review.* The same two reviewers read the remaining papers and removed those based on data collected before the cut-off date.
3. *Classification.* Papers that passed were sorted into four groups: descriptive papers (case reviews, project reports and literature reviews); potential risk factors; other associated health outcomes; and interventions (dosage, training or task-shifting).

Rating. Documents that identified causes of PE/E were rated high, those reporting outcomes were rated medium, and those lacking a comparison or control group were rated low.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

3. Results

3.1 Study selection

The searches returned 11,766 records. Screening of titles and abstracts removed 10,840, leaving 926 for full-text review. Of these, 690 were excluded because their data predated 2005, and 10 could not be obtained, leaving 226 papers for analysis. Descriptive papers formed the large majority (147, or about 65%). The remaining 79 were spread across three groups: 33 on other health outcomes, 26 on interventions and 20 on risk factors. (The source states a 2000–2015 window in its methods but applies a pre-2005 data exclusion at full-text stage; this inconsistency is noted in the limitations.)

3.2 Risk factors

Pre-eclampsia was most common in first pregnancies, in adolescents, in women over 40, and in multiple (twin) pregnancies. Other factors reported were gestational and pre-gestational diabetes (including insulin-dependent diabetes), antiphospholipid syndrome, a family history of hypertension, chronic hypertension, kidney or autoimmune disease, high pre-pregnancy or booking body mass index, mental stress and depression, fetal malformation, and a gap of ten or more years since the last pregnancy. Biochemical and physiological links included abnormal blood fats (raised triglycerides and lowered HDL-cholesterol), raised bilirubin and liver enzymes (as in HELLP syndrome), abnormal Doppler findings, amniotic fluid index, and dietary habits. Several facility-based studies also pointed to social conditions such as poverty, illiteracy, low household income, unemployment and gender inequality.

3.3 Outcomes

PE/E was associated with swelling, headache, seizures and death in mothers. For babies it was linked to restricted growth, stillbirth, low birth weight, low Apgar scores and perinatal death. Other complications included placental abruption and bleeding, HELLP syndrome, visual disturbance, and kidney problems such as acute kidney injury (reported at 4–36% in developing countries) and acute renal failure, both of which carry high illness and death rates.

Delivery was mostly by caesarean section. In a Peshawar study, caesareans made up 22% of births, and pregnancy-induced hypertension accounted for 6 percentage points of that figure. Emergency caesareans caused significantly more maternal illness than planned ones.

Hospital case series show the scale of the problem. In one study of 2,702 deliveries, 5.5% of mothers were hypertensive; eclampsia was the commonest complication (32% of those cases) and 4% of the women died. Another series found eclampsia in 3.23% of 2,100 labour-ward admissions, with complications including retroplacental haemorrhage, aspiration pneumonia, stroke and disseminated intravascular coagulation (DIC). Prematurity was the leading cause of perinatal death.

3.4 Detection

Detecting the condition early can reduce its severity. Diabetes (before or during pregnancy), a family history of hypertension and mental stress may act as screening cues. Blood levels of sFlt-1 in the early second trimester and placental growth factor later in the second trimester were reported as predictors in first-time mothers. Regular antenatal check-ups remain the single most valuable tool for early diagnosis.

3.5 Treatment and management

General clinical care. Recommended practice includes taking note of any personal or family history of PE/E, recording blood pressure properly at antenatal visits, recognising the disease early (it is often symptomless), referring women according to agreed admission criteria, following agreed protocols for blood-pressure-lowering and anticonvulsant drugs (with MgSO4 preferred), timing delivery to avoid serious complications, and offering postnatal follow-up with contraceptive counselling. Low-dose aspirin and low-molecular-weight heparin were reported to be safe in pregnancy and helpful in recurrent pregnancy loss caused by antiphospholipid syndrome. Metformin was described as an effective, inexpensive option for gestational

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

diabetes. Misoprostol given by trained traditional birth attendants lowered postpartum haemorrhage in home births by 24%.

Magnesium sulphate. MgSO4 is regarded as the best drug for both preventing and treating eclamptic seizures. It is cheap, easy to monitor, and therefore suitable for primary-care providers. WHO evidence shows it lowers the risk of eclampsia by 59% compared with placebo and other anticonvulsants. In Pakistan it is registered as first-line treatment and is listed in the National Essential Medicines List, the Pakistan National Formulary and the MNCH EmONC training manual. The Pritchard regimen is used: a loading dose by intravenous and intramuscular routes, then intramuscular maintenance doses every four hours until 24 hours after delivery. Care involves watching urine output, knee reflexes and breathing rate, with calcium gluconate as the antidote. Dosing should follow clinical guidance, and routine blood magnesium testing is unnecessary.

Barriers to MgSO4 use. National policy matches international standards, but practice lags behind. The reported obstacles were:

- Interrupted supply and shortages in some provinces, and fragmented registration, procurement and distribution.
- A low-priced product in a small market, giving manufacturers little commercial motivation.
- Hard-to-calculate doses that providers must remember and prepare themselves.
- Lack of training, absence from in-service programmes, and low familiarity.
- Provider hesitancy over perceived side effects, including misconceptions among senior obstetricians.
- Unsafe practice, such as giving diazepam together with MgSO4 in some teaching hospitals.
- Missing clinical guidelines and equipment, delayed second doses after referral, and poor community awareness.

Training programmes were found to be strongly helpful, even in non-teaching facilities.

Prevention. At community level, strategies include routine antenatal care, accessible facilities with quick referral, public education, birth spacing, nutritional support, and supplements of vitamin D, calcium, iron and folic acid (the evidence for calcium and vitamin D needs further study). At facility level, they include upgrading tertiary hospitals, skilled staff, emergency obstetric care, intensive care services and team-based management. At system level, they include combining reproductive, maternal, newborn and child health programmes with nutrition programmes, logbooks to track skills, sustained funding, political commitment, extended antenatal clinic hours, gender empowerment, and joint obstetric–psychiatric care for depression.

4. Discussion

The literature suggests that PE/E in Pakistan stems from both biological risk and failures in the health system. Many risk factors can be modified or spotted through antenatal care, yet late booking, poverty, low literacy and women's limited decision-making power reduce access to it. Most of the evidence is descriptive and hospital-based (147 of 226 papers), so it says little about community-level burden or prevalence. MgSO4 is effective, cheap and in policy, yet little used. Only one reviewed study examined the barriers in depth, and none measured how often it is used or what impact its use has.

Suggested responses include multiple suppliers and year-round availability, purchase of prefilled standard doses, training needs assessments followed by skills-based training for doctors, midwives, traditional birth attendants and community health workers, and nationally, provincially and regionally endorsed guidelines (the White Ribbon Alliance trainees' manual is a useful resource). Complementary action on antenatal care, skilled birth attendance, postnatal care, family planning, nutrition and women's empowerment is also required.

Limitations.

The review relies on published English-language literature, and many sources were single-hospital studies. The rating scheme was coarse, no formal quality appraisal or meta-analysis was done, and a large share of included papers were not specific to PE/E. The reported selection window is inconsistent, and some references are duplicated.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

5. Conclusions and Recommendations

MgSO4 is the recommended treatment for PE/E, yet it remains inadequately used in Pakistan. To lower deaths from PE/E, the evidence supports the following:

1. Secure a reliable, year-round MgSO4 supply with several suppliers and prefilled doses.
2. Develop and adopt national clinical guidelines.
3. Train providers, including community-level workers, in screening, dose preparation and administration.
4. Strengthen antenatal care, referral and emergency obstetric care.
5. Tackle social determinants through nutrition, education and gender empowerment.

Future research should explore barriers to MgSO4 availability at every level, ways to scale up its use, its impact and cost-effectiveness, gaps in training, and community-based determinants of PE/E.

REFERENCES

Shamsi U, Hatcher J, Shamsi A, et al. A multicentre matched case control study of risk factors for preeclampsia in healthy women in Pakistan. BMC Women's Health. 2010;10:14.

Bigdeli M, Zafar S, Assad H, Ghaffar A. Health system barriers to access and use of magnesium sulfate for women with severe pre-eclampsia and eclampsia in Pakistan: evidence for policy and practice. PLoS One. 2013;8(3):e59158.

Shaheen B, Hassan L, Obaid M. Eclampsia, a major cause of maternal and perinatal mortality: a prospective analysis at a tertiary care hospital of Peshawar. J Pak Med Assoc. 2003;53(8):346–350.

Perveen S. Frequency and impact of hypertensive disorders of pregnancy. J Ayub Med Coll Abbottabad. 2014;26:518–521.

Sultana R, Bashir R, Khan B. Presentation and management outcome of eclampsia at Ayub Teaching Hospital, Abbottabad. 2005.

Rohra DK, Zeb A, Qureishi RN, et al. Prediction of pre-eclampsia during early pregnancy in primiparas with sFlt-1 and PlGF. Natl Med J India. 2012;25(2):68.

Mumtaz F, Memon AR, Yousfani S, et al. Role of serum leptin level as a marker of severity of pre-eclampsia. J Ayub Med Coll Abbottabad. 2008;20(1):13–15.

Munazza B, Raza N, Naureen A, et al. Liver function tests in preeclampsia. J Ayub Med Coll Abbottabad. 2011;23(4):3–5.

Aziz R, Mahboob T. Pre-eclampsia and lipid profile. Pak J Med Sci. 2007;23(5):751–754.

Imdad A, Jabeen A, Bhutta ZA. Role of calcium supplementation during pregnancy in reducing risk of developing gestational hypertensive disorders: a meta-analysis of studies from developing countries. BMC Public Health. 2011;11(Suppl 3):S18.

Hossain N, Kanani FH, Ramzan S, et al. Obstetric and neonatal outcomes of maternal vitamin D supplementation: an open-label RCT in Pakistani women. J Clin Endocrinol Metab. 2014;99(7):2448–2455.

Arain N, Mirza WA, Aslam M. Vitamin D and the prevention of preeclampsia: a systematic review. Pak J Pharm Sci. 2015;28(3):1015–1021.

Jabeen M, Yakoob MY, Imdad A, Bhutta ZA. Impact of interventions to prevent and manage preeclampsia and eclampsia on stillbirths. BMC Public Health. 2011;11(Suppl 3):S6.

Mobeen N, Durocher J, Zuberi NF, et al. Administration of misoprostol by trained traditional birth attendants to prevent postpartum haemorrhage in homebirths in Pakistan: a randomised placebo-controlled trial. BJOG. 2011;118(3):353–361.

Ainuddin J, Karim N, Hasan AA, Naqvi SA. Metformin versus insulin treatment in gestational diabetes in a developing country: a randomized control trial. Diabetes Res Clin Pract. 2015;107(2):290–299.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Rizwan N, Rauf S, Farhan-Uddin S. Maternal and perinatal outcomes among women with eclampsia admitted to a tertiary care hospital in Hyderabad, Pakistan. Int J Gynaecol Obstet. 2013;123(3):247–248.

Riaz S, Habib S, Jabeen A. Frequency of maternal mortality and morbidity in pregnancy-induced hypertension. J Ayub Med Coll Abbottabad. 2011;23(4):61–63.

Bentata Y, Housni B, Mimouni A, Azzouzi A, Abouqal R. Acute kidney injury related to pregnancy in developing countries: etiology and risk factors in an intensive care unit. J Nephrol. 2012;25(5):764–775.

Naeem M, Khan MZ, Abbas SH, et al. Rate and indications of elective and emergency caesarean section: a study in a tertiary care hospital of Peshawar. J Ayub Med Coll Abbottabad. 2015;27(1):151–154.

Utz B, Zafar S, Arshad N, et al. Status of emergency obstetric care in four districts of Punjab, Pakistan. J Pak Med Assoc. 2015;65(5):480–485.

Zafar S, Hafeez A, Qureshi F, Arshad N, Southall D. Structured training in the management of emergencies in mothers, babies and children in a poorly resourced health system: logbooks to document skill use. Resuscitation. 2009;80(4):449–452.

Lassi ZS, Haider BA, Bhutta ZA. Community-based intervention packages for reducing maternal and neonatal morbidity and mortality. Cochrane Database Syst Rev. 2010;(11):CD007754.

Haider BA, Bhutta ZA. Multiple-micronutrient supplementation for women during pregnancy. Cochrane Database Syst Rev. 2006;(4):CD004905.

Fikree FF, Mir AM, Haq IU. She may reach a facility but will still die! An analysis of quality of public sector maternal health services, District Multan, Pakistan. J Pak Med Assoc. 2006;56(4):156–163.

Kassebaum NJ, et al. Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2014;384(9947):980–1004.

National Institute of Population Studies. Pakistan Demographic and Health Survey 2012–13. Islamabad: NIPS; 2013.

World Health Organization. WHO Recommendations for Prevention and Treatment of Pre-eclampsia and Eclampsia. Geneva: WHO; 2011.

White Ribbon Alliance and Research and Advocacy Fund Pakistan. Use of Magnesium Sulphate as a First Line Treatment in Severe Pre-eclampsia and Eclampsia: Trainees' Manual for Health Care Professionals.

Shaikh S, Mir AM. A systematic review of the treatment and management of pre-eclampsia and eclampsia in Pakistan. Islamabad: Population Council; 2016.