Meta-Analysis

Exploring the burden and associated risk factors of antenatal depression: a systematic review and meta-analysis

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ABSTRACT

Antenatal depression (AND) is a critical public health issue affecting a significant number of pregnant women worldwide, particularly in low- and middle-income countries. This review synthesizes findings from 40 studies, primarily observational research and randomized controlled trials, published between January 2011 and December 2024, sourced from academic databases including Google Scholar and PubMed. The objective is to explore regional variations in the burden of AND and identify associated risk factors. The evidence reveals that risk factors for AND can be grouped into five categories: family and community dynamics, violence and abuse, obstetric factors, psychological issues, and socio-demographic conditions. Among these, inadequate social support and poor partner relationships consistently emerged as strong predictors. Exposure to violence, especially domestic abuse, significantly increased the risk. Obstetric factors such as unintended pregnancies, high gravidity, and past miscarriages were also linked to higher AND prevalence. In addition, psychological history, including prior episodes of depression or anxiety, played a central role in increasing vulnerability. Socio-demographic elements such as marital status and financial hardship further shaped the risk landscape. These findings emphasize the need for culturally sensitive interventions that strengthen social support networks, address intimate partner violence, and expand access to targeted maternal mental health care.

Keywords: Antenatal depression, Maternal mental health, Violence and abuse, Family dynamics, History of miscarriage

INTRODUCTION

Pregnancy involves complex physiological and hormonal changes, including fluctuations in estrogen, progesterone, cortisol, and human chorionic gonadotropin (hCG), which influence both physical and mental health.[1] These biological changes, coupled with psychosocial factors, contribute to the risk of antenatal depression, which affects approximately 10-20% of pregnant women globally. A recent meta-analysis estimates a pooled prevalence of antenatal depression at 20.7% (95% CI 19.4-21.9) with higher rates reported in low- and middle-income countries.[2,3] Along with these, many additional factors negatively impacts PW, such as psychosocial stressors, lack of social support, intimate partner violence, financial insecurity, unplanned pregnancy, pre-existing mental health conditions, and cultural stigma surrounding emotional vulnerability during pregnancy.[4] There are high chances that these predictors were present before conception and persists during and after the pregnancy as well which might heighten the anxiety and in eventually the depressive symptoms among PW.[5] Some symptoms can help in recognizing the incidence of AND among PW includes the low mood, reduced concentration, difficulties with sleeping and eating, persistent feelings of irritability and anxiety excluding the psychosis, i.e., experience of a loss of touch with reality or hallucinations.[6,7]

Globally, the prevalence of AND is 20.7%, and low- and middle-income countries present the doubled prevalence (19.2%) then high-income countries (9.2%).[3,8,9] The highest burden was reported in Eastern Mediterranean Region (40.3%) followed by South-east Asia (19.4%), Africa (36.2%), Americas (19.6%), Western Pacific Region (19.2%) and least in the European region (17.9%).[8] Similarly, a recent systematic review reported that AD is common in low-and middle-income countries, affecting one in four perinatal women, with a total prevalence of 25.5%.[9]

In India the reported prevalence of depressive symptoms higher among females than males of all age groups and ranges 3.8% to 65% for depression and 13% to 55% anxiety during pregnancy.[10,11] A critical factor that is the suicidality among women in early pregnancy (<20 weeks) was 7.6%.[11] While some studies have shown that the prevalence of AND was higher in the third (26.7%) and followed by the first trimester (10.5%), with stability at the second trimester (6.5%).[12] While there were some studies have contradicted by reporting the highest prevalence at second and third trimesters around 12.4% as compared to the first trimester (7.4%).[13]

AND can have significant negative consequences on both the mother and the developing foetus, for instance, an increased risk of preterm births, low birth weights, preeclampsia, as well as severe emotional and behavioural complications such as suicidal tendencies in mothers.[6,14] The existing studies suggest that AND serves as an indicator for postpartum depression (PPD), meaning, the depressive symptoms of pregnancy can continue or worsen after childbirth. The early identification and hence intervention can significantly reduce the risk of maternal obstetric complications and developing PPD.[15]

Globally, AND prevalence has significant variability due to differences in cultural, socioeconomic, and healthcare contexts.[3,16,17] Previous studies revealed that its high prevalence was associated with household circumstances such as poor social support, unplanned pregnancy, history of depression, unemployed status, and financial problems.[8]

However, there is a lack of categorization of these risk factors and assessment of how these categories of factors influence the prevalence of AND in different regions of the world. The identification and characterization of associated risk factors are often inconsistent across studies, mainly due to variations in sample sizes, methodologies, and diagnostic criteria, further complicating the development of standardized protocols for treatment and prevention.[1,18]

The systematic categorization of these risk factors into broad domains may support the personalized strategies, enhancing the effectiveness of screening and treatment protocols for PW at risk of AND.[19,20] Furthermore, it will clarify gaps in the existing literature, guiding future research and informing public health policies aimed at reducing the burden of AND.[3,21,22] Hence, this comprehensive review will provide a comprehensive synthesis of the evidence on the risk factors for AND, categorized into broader thematic domains for better understanding.

METHODS

This review was conducted to synthesize the current global evidence on the burden and risk factors associated with AND, with particular emphasis on epidemiological trends and sociocultural influences across diverse geographical contexts. Studies from all continents were considered to capture variation in prevalence, risk profiles, and contextual determinants of AND in both high- and low-resource settings. A systematic and structured approach was used to ensure broad and transparent identification, selection, and synthesis of relevant literature.

The systematic review and meta-analysis design was chosen because the evidence base on AND is heterogeneous, encompassing multiple study designs, populations, and measurement tools, and because this approach allows for comprehensive mapping of existing research, identification of knowledge gaps, and synthesis of a wide range of evidence. The review process involved the development of a robust search strategy, the application of predefined inclusion and exclusion criteria, and systematic data extraction and synthesis from eligible studies. Priority was given to studies employing validated diagnostic instruments and rigorous methodological designs to ensure reliability and relevance to the research objectives.

Data extraction and synthesis

Search strategy

A systematic literature search was conducted primarily in PubMed using combinations of the terms "antenatal depression," "prenatal depression," "depression during pregnancy," and "antenatal anxiety." This initial search retrieved 1,944 records. Pregnancy-related filters (antenatal, antepartum, perinatal, during pregnancy, during gestation, and antenatal period) were applied, yielding 1,752 records.

Methodological and outcome-related filters were subsequently applied, including observational study designs (prospective cohort, longitudinal, and cross-sectional) and epidemiological outcomes (risk factors, predictors, determinants, burden, prevalence, or incidence), resulting in 547 potentially relevant records.

After title and abstract screening, 140 full-text articles were assessed for eligibility. Of these, 407 studies were excluded because they were qualitative or mixed-methods studies, did not report quantitative risk-factor analyses, did not focus on the antenatal period, or contained insufficient or non-extractable data.

The review included studies published from January, 2011 to December, 2024. Ultimately, 40 studies met all inclusion criteria and were included in the final synthesis. The study selection process is summarized in the PRISMA flow diagram (Figure 1).

Although PubMed served as the primary bibliographic database and the source of the reproducible search strategy, Google Scholar was also used as a supplementary source to retrieve full-text articles not available through PubMed and to identify additional relevant records through citation tracking. Only the PubMed search strategy is presented in this review because PubMed provides a structured, transparent, and reproducible search interface, which is required under PRISMA guidelines, whereas Google Scholar does not support fully reproducible Boolean search strategies.

Inclusion criteria

Studies were included if they met all of the following criteria. The study population had to consist of pregnant women in the antenatal or prenatal period, with pregnancy status or gestational age clearly defined. Eligible studies were required to assess antenatal depression (AND) using a validated screening instrument or standardized diagnostic criteria, such as the Edinburgh postnatal depression scale (EPDS), patient health questionnaire (PHQ-9), Beck depression inventory (BDI), hospital anxiety and depression scale (HADS), DSM-V, or ICD-10.

In addition, studies had to report a quantitative estimate of AND, including prevalence, incidence, or severity, and examine at least one risk factor or predictor of AND, including socio-demographic, obstetric, psychosocial, biological, or environmental variables. Eligible study designs included observational studies (cohort, longitudinal, and cross-sectional), and randomized controlled trials were included only if they reported baseline risk-factor data relevant to antenatal depression.

Exclusion criteria

Studies were excluded if they were qualitative or mixed-methods studies, editorials, commentaries, case reports, or reviews that did not provide original quantitative data. Articles were also excluded if they did not focus on the antenatal period, did not use a validated screening instrument or standardized diagnostic criteria to assess depression, did not report a quantitative estimate of antenatal depression burden, or did not analyse risk factors or predictors. Studies that focused exclusively on postpartum depression or on non-depressive outcomes, such as anxiety or stress without comorbid depression, were not considered eligible.

In addition, studies with insufficient, unclear, or non-extractable data were excluded. Research addressing perinatal mental health was excluded if the antenatal period could not be clearly distinguished from the postpartum period.
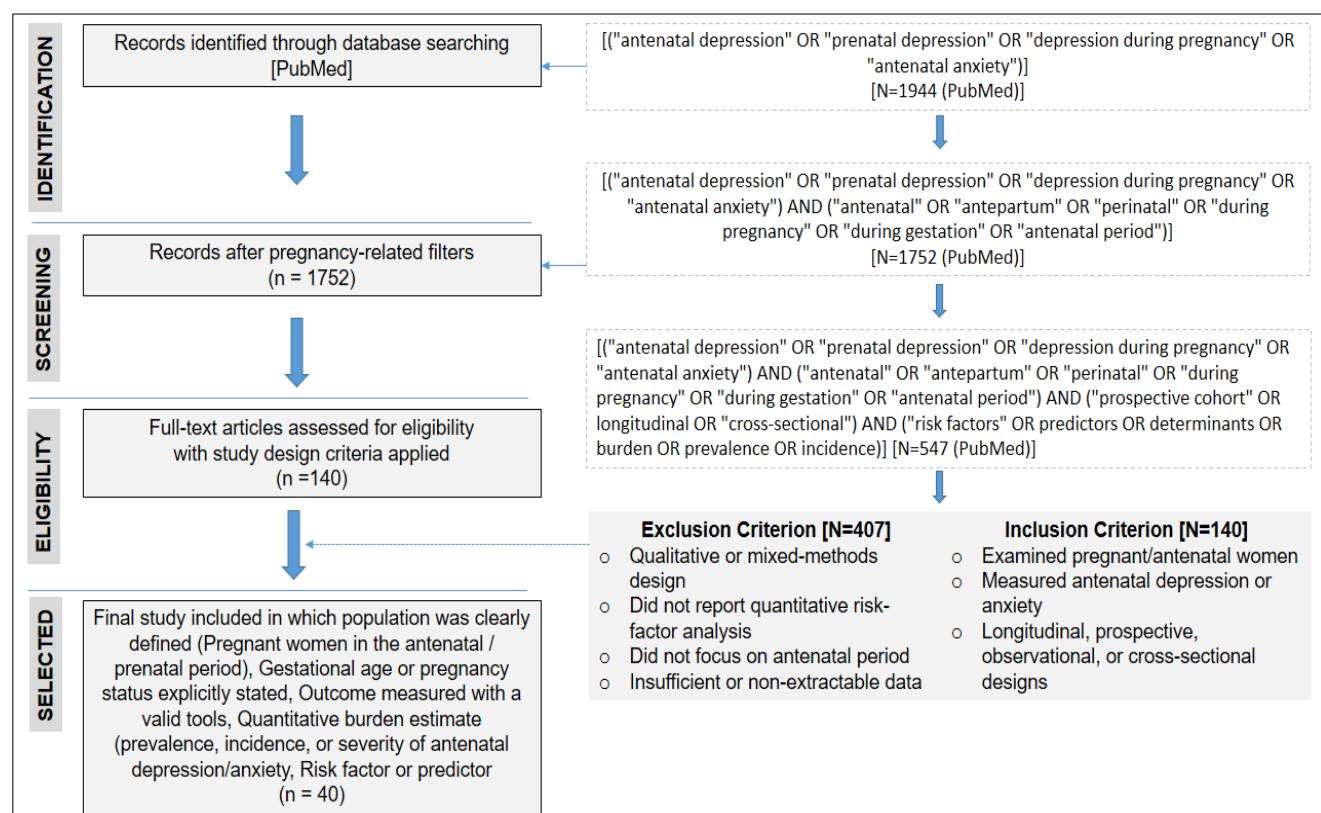

Figure 1: PRISMA diagram for study selection.

Study selection process

All records were exported to reference management software for duplicate removal. Screening was conducted in two stages. First, titles and abstracts were independently screened by two reviewers against the eligibility criteria. Second, full-text articles were retrieved and independently assessed for inclusion. Disagreements were resolved through consensus discussion among the authors.

Data extraction and synthesis

Data were extracted from each included study using a standardized form, which included study design, country, sample size, participant characteristics, gestational age, depression assessment tool, prevalence or incidence of AND, risk factors examined, and statistical methods used. A structured synthesis was conducted, grouping risk factors into socio-demographic, psychosocial, obstetric, biological, and environmental domains to identify consistent patterns associated with antenatal depression.

Data analysis

A mixed-methods approach was employed for data analysis, combining both quantitative and qualitative synthesis techniques to accommodate the heterogeneity in study designs and reporting styles. Quantitative data from included studies were compiled and summarized using descriptive statistics such as frequency, prevalence rates, and proportions. Where applicable, effect sizes (e.g., odds ratios, relative risk) were extracted. Basic statistical analyses were conducted using STATA version 17, and data were stratified by risk factor category (e.g., psychosocial, socio-demographic, obstetric). For studies with qualitative elements or heterogeneous methodologies, a thematic synthesis was performed to identify and categorize recurring patterns and themes in the reported risk factors and their social or cultural contexts. This dual approach allowed for a more nuanced understanding of antenatal depression across varied research framework.

RESULTS

A total of 40 eligible studies published between January 2011 and December 2024 were included in the final review. The analysis highlights that risk factors associated with AND can be broadly categorized into five key domains: family and community dynamics, experiences of violence and abuse, obstetric-related factors, psychological factors, and socio-demographic characteristics. The findings, as summarised in Table 1, identify 42 distinct risk factors reported across the 40 studies, highlighting the multifaceted nature of AND and the interplay between individual, relational, and structural determinants.

The wide range of risk factors associated with AND observed across the reviewed studies can be attributed to multiple methodological and contextual variations. One key source of variability is the use of different diagnostic tools for assessing AND. Each tool differs in its sensitivity, specificity, and scope, potentially influencing the identification and interpretation of associated risk factors. The majority of the studies (N=24) utilized the Edinburgh postnatal depression scale (EPDS) while seven studies used the Hamilton depression rating scale (HAM-D).[2,4,23,43-48] Further inter-study variation exists in the diagnostic thresholds applied within the same tool, particularly for the EPDS, ranging from scores of 10 to 13 to define clinically significant depression. These threshold differences may reflect cultural nuances, population demographics, clinical contexts, translation and adaptation of tools, methodological approaches, or sample size considerations.

In addition to diagnostic heterogeneity, substantial differences in participant characteristics and study settings contribute to variability in reported risk factors. This includes differences in maternal age (ranging from <18 to 38 years), gravidity, socio-demographic status, cultural background, and geographic location. The timing of AND assessment also varied, with some studies capturing trimester-specific risk although most studies assessed AND at any stage of pregnancy, with the second and third trimesters being most commonly reported.[32,34,44,47,49]

Geographically, the 40 included studies were distributed across various regions: 19 from Asia, 10 from Africa, 7 from Europe, 3 from the Middle East, and 2 from the Americas. In terms of study design, 24 were cross-sectional and 16 were cohort studies. This diversity further underscores the complexity of synthesizing AND risk factors across heterogeneous settings.

We have divided the risk factors for AND into six main categories, each having sub-categories within. We then reported the findings of the included studies into the following main categories and sub categories (Figure 2), Figure 3 shows the country wise prevalence of AND, and Figure 4 shows the Continent Wise prevalence of AND. To facilitate a comprehensive understanding of the diverse factors associated with antenatal depression (AND), we categorized the identified risk factors into six primary domains, each encompassing relevant sub-categories. The synthesis of findings from the included studies was organized and reported accordingly (Figure 2).

Furthermore, the geographical distribution of AND prevalence was examined to contextualize the burden across different settings. Figure 3 illustrates the country-wise prevalence of AND as reported in the reviewed studies, while Figure 4 presents a broader view by depicting continent-wise prevalence rates.

These visual representations underscore regional disparities and may reflect differences in health systems, cultural perceptions of mental health, and methodological approaches to diagnosis and reporting.

Family and community dynamics

Research across diverse contexts consistently underscores the profound influence of family and community dynamics on maternal mental health, particularly regarding AND. A recurring finding in the literature is the protective effect of strong social and emotional support networks during pregnancy. Numerous studies report that women experiencing AND often perceive or experience low levels of social support, suggesting that supportive interpersonal relationships play a buffering role against emotional distress in the perinatal period.[50-52]

Supportive relationships, especially with partners and close family, are repeatedly identified as key protective factors. For instance, a large cross-sectional study in China found that good partner relationships (OR=0.40) and strong social support (OR=0.92) significantly reduced the risk of AND, which had a prevalence of 28.2%.[32] Similarly, Jeong et al in Korea highlighted that emotional support from partners and mothers decreased the risk of AND, with significant odds ratios (partner: OR=2.23; mother: OR=1.43), emphasizing the critical role of familial and spousal involvement in promoting maternal mental well-being.[38] These findings connect with results from Pakistan, where poor partner relationships were also significantly associated with AND, indicating a cross-cultural pattern in the influence of intimate relationship quality on maternal mental health.[43]

Conversely, poor or absent social support has consistently been linked to increased depressive symptoms, extending even into the postpartum period. A Canadian study by found that 16.4% of women with inadequate social support during pregnancy developed postpartum depressive symptoms.[35] Similarly, Bayrampour et al noted that partner tension significantly predicted anxiety symptoms in a large cohort (aOR=1.94), suggesting that emotional strain within relationships can erode psychological resilience during pregnancy.[50] This pattern further connects with findings from Ali et al, who observed that participation in household decision-making reduced anxiety and depression symptoms, emphasizing how empowerment within the family dynamic contributes positively to maternal mental health.[48]

Cultural and societal structures deeply shape these interpersonal dynamics. In South Asian contexts, especially in Pakistan and India, traditional gender norms and expectations often contribute to familial tension, particularly involving in-laws and parents. Studies have shown that such tension exacerbates emotional distress during pregnancy. Giardinelli et al found that conflictual relationships with family (OR=2.68) and partners (OR=4.20) were strongly associated with AND and continued to impact mental health during the postnatal period.[42]

The implications are even more pronounced in settings where son preference and gender-based societal pressures prevail. For example, Waqas et al reported that having more daughters was linked to increased anxiety and lower social support.[4] Marchesi et al added that lack of familial support predicted panic disorder during pregnancy (OR=4.2), showing the compounding effects of cultural expectations and emotional isolation.[44]

Notably, the quality of social connections matters more than their quantity. In an Italian study, women living communally with friends had higher depressive symptoms than those living alone, indicating that cohabitation does not necessarily translate into meaningful support.[40] Altogether, findings across contexts consistently highlight that strong partner relationships, emotional support, autonomy in household decisions, and culturally sensitive support systems are vital in protecting against AND. Conversely, strained relationships, lack of autonomy, and sociocultural pressures, especially in low-resource, patriarchal South Asian regions like Pakistan, heighten the risk, underscoring the need for targeted interventions that address both individual and systemic determinants of maternal mental health.

Violence and abuse

Violence, particularly intimate partner violence (IPV), has profound implications for maternal mental health, especially during pregnancy, a period often marked by vulnerability and heightened emotional sensitivity. While pregnancy is traditionally associated with joy and anticipation, for many women, it becomes a time of trauma and distress, significantly increasing the risk of AND. A growing body of evidence links IPV to elevated depressive symptoms during pregnancy, demonstrating that abuse is both a psychological and structural determinant of maternal well-being.

In Kenya, a study involving 862 pregnant women reported a high AND prevalence of 32.3% among those exposed to domestic violence, with an adjusted odds ratio (aOR) of 18.3, indicating a significantly elevated risk.[52] Similar findings have been reported in LMICs such as India, Ethiopia, and Turkey, where women exposed to IPV exhibited higher levels of depressive symptoms during pregnancy.[29,34] In South Asian and Southeast Asian patriarchal societies, the compounded impact of IPV and early-life trauma has been shown to contribute not only to AND but also to long-term common mental disorders (CMDs), revealing the enduring psychological toll of abuse.[43,53] Abuse during pregnancy is rarely limited to physical violence; it often includes sexual coercion, verbal insults, and psychological control, as highlighted in studies from diverse regions including Germany, India, and Turkey.[54,55] These manifestations reflect broader structural inequities rooted in gender-based power imbalances. In many South Asian and sub-Saharan African communities, patriarchal norms, dowry-related pressures, and fertility expectations, especially son preference, intensify the emotional burden on women and normalize coercive control in intimate relationships.

Table 1: Characteristics of studies showing risk factors associated with antenatal depression.

Authors (years)	Country	Study design	Sample size	Mean, median and age category	TOA	SC (TV)	AND (%)	Risk factors	Results
Roy et al (2023)	Odisha, India	Retrospective cohort study	322	<18 ≥18	AND (3T)	EPDS (≥13)	28	Unplanned Pregnancy History of abortion History of any pregnancy complications	–
Insan et al (2023)	Bangla-desh	Cross-sectional study	235	25	AND	EPDS (≥10)	56	Intimate partner violence Perceived husband's male gender preference	aOR=10.4; 2.7-39.7 aOR=9.9; 1.6-59.6
Nisarga et al (2022)	Karnata-ka, India	Hospital-based cross-sectional study	222	18-25= 69.4% 26-40= 30.6%	AND	EPDS (≥12)	25.67	Low education Intimate partner violence Daily alcohol use by husband Poor relationship with in-laws Poor relationship with parents gravida Parity Previous abortions Fear of labour Complications during pregnancy	OR=1.87; 1.0-3.5 OR=5.13; 1.7-15.6 OR=15.76; 1.8-13.8 OR=15.28; 3.2-73.1 OR=21.73; 4.7-10 OR=5.54; 0.9-31.1 OR=4.18; 1.3-13.6) OR=2.83 (1.3-6.2) OR=5.77 (2.9-11.6) OR=3.01 (1.6-5.6)
AMANHI study (2022)	Pakistan and Banglade-sh cohort	Longitudinal cohort study	4,366	23.4 (PAK) 26.8 (BGD)	AND (1T) PP (42 days)	PHQ-9 (≥12)	6.20	Parity (≥2) High wealth status	RR=1.41 (1.02–1.95)
Prabhu et al (2022)	South India	Hospital based cross sectional study	314	29:46 (±4.29)	AND	EPDS (>13)	21.90	↓ Marital age	aOR=2.01; 0.56-7.20
Chalise et al (2022)	Nepal	Community-based cross-sectional study	350	26.6 (±4.60)	AND	EPDS (≥10)	24.80	Multigravida Unintended pregnancy Gender preferences Intimate partner violence	aOR=2.21;1.11-4.42 aOR=2.54 (1.20-5.38) aOR=2.53 (1.20-5.32) aOR=2.27 (1.11-4.64)
Nech et al (2020)	Dessie, Ethiopia	Cross sectional survey	378	29.85 (±6.39)	PPD	EPDS (≥13)	27	Socio-demographic Child's gender Unplanned pregnancy Intimate partner violence Sexual and physical abuse	aOR=4.9; 1.27, 16.74 aOR=3.1; 1.62, 6.69 aOR=2.5; 1.76, 7.23 aOR=6.5; 1.98, 15.85 aOR=3.46;2.34, 18.5

Continued.

Authors (years)	Country	Study design	Sample size	Mean, median and age category	TOA	SC (TV)	AND (%)	Risk factors	Results
								Current husband alcoholism Current substance use	aOR=2.2: 1.48, 5.34 aOR=1.8; 1.16, 3.75
Mierieri et al (2020)	Mombasa County, Kenya	Hospital-based case-control study	170	27.8	AND	EPDS (≥13)	20	Unemployment	aOR=2.4; 1.4-4.2
Tiki et al (2020)	West Shoa zone, Oromia regional state, Ethiopia	Community-based cross-sectional study	862	28.41 (±5.9)	AND	PHQ-9 (≥8)	32.3	Marital status Low income Social support Domestic violence Unplanned pregnancy History of abortions	aOR=17.1;4.0-73.0 aOR=3.19; 1.47- 6.96 aOR=0.2; 0.05-0.8 aOR=18.3; 5.7-58.7 aOR=1.52; 1.04- 2.21 aOR=5.13; 2.42-10.85
Asselmann et al (2020)	MARI Study, Germany	Prospective-longitudinal study	306	20–35	AND & PPD (T1:10–12/ T2: 22–24/ T3: 35–37/ T5: 2 months PP/ T6: 4 months PP/ T7: 16 months PP)	CIDI-V	T3=10.4 (AA) T3=14.6 (AD)	Less emotionally stable women Social support	b=-0.294 to -0.415 b=-0.225 to -0.308
Sheeba et al (2019)	Bangalore, southern region	Hospital based cohort study	280	23.02 (± 3.40)	AND (<24 weeks)	EPDS (≥13) MSPSS DAS-48 MCTS PRAQ (>28)	35.7	Domestic violence Multigravida Unplanned pregnancy Low support Marital dicord Pregnancy related anxiety History of catastrophic event	aOR=5.916 (1.703–20.558) aOR=1.386(0.793–2.424) aOR=1.604 (0.925–2.782) aOR=1.785(0.915–3.481) aOR=1.517(0.862–2.671) aOR=2.016(1.134–3.587) aOR=2.148 (1.203–3.837)
Johnson et al (2019)	Antenatal clinic, of Bengaluru	Hospital based cross sectional study	208	24.47 (± 3.93)	AND	CIS-R (≥12)	3.8 (AND) 15.4 (ADS)	Poor relationship with spouse Poor relationship in-laws Preference for a female child	P=0.007 P=0.001 P=0.003

Continued.

Authors (years)	Country	Study design	Sample size	Mean, median and age category	TOA	SC (TV)	AND (%)	Risk factors	Results
Joshi et al (2019)	Kathman-du, Nepal	Mixed-method cross-sectional study	143	24 (±4.1)	AND	HAM-D (≥10)	18 (ADS)	Health problems Gender preference	aOR=4.8;1.1–20.7 aOR=3.7; 1.2–11.6
Silveria et al (2019)	Pelotas, Brazil	Population-based cohort study	3065	NA	PPD (1T)	HAM-D (≥13) moderate and (≥15) severe	9.4 (moderate PD and 5.7 (marked/severe PD	Verbal abuse Disrespect and abuse Physical abuse	OR=1.58;1.06–2.33 OR=1.56;1.07–2.27 OR=2.26; 1.26–4.08
Abebe et al (2019)	Bahir Dar Town, Northwest Ethiopia	Institution-based cross-sectional study	511	24.3 (±3.83)	PPD (within 6 months)	HAM-D ≥13	22.1 (ADS)	Stressful life event Domestic decision making Unplanned pregnancy Partner violence Hospitalization of baby	aOR=4.46; 2.64, 7.54 aOR=4.26; 2.54, 7.14 aOR=1.86; 1.02, 3.41 aOR=3.16; 1.76, 5.67 aOR=2.24; 1.17, 4.310
Shakeel et al (2016)	Norway	Population-based, prospective cohort study	749	29.9 (±4.84)	AND (28weeks)	EPDS (≥ 10)	WE: 8.6/ ME: 19.5SA: 17.5	History of depression	OR=3.01; 1.86-5.14
Yusuff et al (2016)	Malaysia	Prospective longitudinal study	2072	26.7 (±5.6)	AND (36-38 weeks)	EPDS	AND=13.8	Planned pregnancy Happy with current pregnancy Oral contraceptive pills History of anxiety	OR=0.45; 0.33-0.60 OR=0.43; 0.21-0.89 OR=1.63; 1.20, 2.22 OR=3.17; 2.35-4.26
Waqas et al (2015)	Lahore	Cross-sectional study	500	27.41±5.6	AND	HADS SPS	ANA=49 AND=31.8	History of harassment Abortion Caesarean delivery Unplanned pregnancies	P≤0 .05
Brittain et al (2015)	South Africa	Cohort study	726	26	AND	BDI-II	AND=21	↓ SES Childhood trauma Intimate partner violence Single marital status Unemployment Unplanned pregnancy	aOR=2.3 (1.3, 4.0) aOR=1.7 (1.1, 2.6) aOR=1.9 (1.2, 2.8) aOR=1.7 (1.1, 2.6) OR=2.3 (1.4, 3.6) aOR=2.0 (1.3, 3.2)
Bayrampour et al (2015)	Canada	Longitudinal cohort study	3021	<25= 5.4% 25-34= 70.7% 35>=24 %	AND (2T &3T)	STAI EPDS (≥13)	<25=10.6(CD)/9.5(CA) 25-34=57.6 (CD) /62.7(CA) 35>=31.8(CD)/ 27.7(CA)	Unintended pregnancy Partner tension Infertility treatments	aOR=3.05;1.61-5.79 aOR=1.94; 1.52-2.48 aOR=4.98; 1.85-13.39

Continued.

Authors (years)	Country	Study design	Sample size	Mean, median and age category	TOA	SC (TV)	AND (%)	Risk factors	Results
Zeng et al (2015)	China	Hospital based cross-sectional study	292	24.18 (±2.59)	AND (3T)	SDS, EPQ, SCSQ, SSRS	AND= 28.5	Marital age Relationship with partner Social support History of miscarriage Irregular menstruation Psychoticism neuroticism personality traits	OR=0.85; 0.76-0.95 OR=0.40; 0.17-0.93 OR=0.92; 0.88-0.97 OR=1.86;1.30-2.66 OR=2.98; 1.64-5.40 OR=1.06;1.02-1.10 OR=1.07; 1.04-1.10
Srinivasan et al (2015)	Chennai, India	Cross-sectional study	100	25 (± 3)	AND	EPDS (≥13)	65	Marital satisfaction	P=0.025
Akçalı et al (2014)	Turkey	Population based cross-sectional study	463	27.52 (± 5.61)	AND (1T)	EPDS (≥12) SCID-I DSM-IV	DD=16.8; MDD=12.3;	Violence within a year Violence during pregnancy History of mental disease	P≤0.001 P≤0.05
Marchesi et al (2014)	Italy	Longitudinal cohort study	237	30.77 (±4.4)	AND (1T/2T/3T/ PD)	PRIME-MD; HADS	1T=33.3 2T=58.3 3T=8.3	↓ Familiar support	OR=4.2; 1.1–15.5
Rubertsson et al (2014)	BETTI study Sweden	Population based study	1175	27.4	AND (1T)	HADS-A (>=8)	1T=15.6	Education Unemployment Fear of child birth History of depression History of anxiety	OR=1.6; 1.1–2.3 OR= 3.5; 2.1–5.8 OR=3.0; 1.9–4.7 OR=3.8; 2.6–5.6 OR=5.2; 3.5–7.9
Verreault et al (2014)	Canada	Observational follow-up study	226	32.10 (±4.49)	AND(3T)/ PPD (3 months)	EPDS (≥ 10)	AND=28.3 PPD=16.4	Low social support History of emotional problems Higher anxiety sensitivity Stressful life event	β=-0.05 β= β= 0.20, p<0.001 β=0.11, p<0.01
Lydsdottir et al (2014)	NA	Cross-sectional study	2411	NA	AND	EPDS; DSM-IV	AND=9.7 MDD=31.4 BPD=13.1 AD=60.8 OCD=17.6 SD=11.8 ED=2		
Räisänen et al (2014)	Finland	Population-based cross-sectional study	511 938	ND=29.6 (±5.4) MD=28.7 (±6.6)	AND	ICD-10	MD=0.8	Fear of childbirth	aOR=2.63; 2.39-2.89

Continued.

Authors (years)	Country	Study design	Sample size	Mean, median and age category	TOA	SC (TV)	AND (%)	Risk factors	Results
Fellenzer et al (2014)	New York USA	Secondary data analysis of State-wide Perinatal Data System	19,219	17 – 35 years	AND	SRMSD	MD=6 SD=2	Low education Low age Unmarried Medi. insurance Unintended pregnancy	aOR=1.87;1.13-3.11 aOR= 1.21;0.90-1.63 aOR=1.41;1.07-1.87 aOR=3.6; 2.6-5.1
Weobong et al (2014)	Sub-Saharan Africa.	Nested DON cohort study (ObaapaVitA & Newhints Trials)	21,135	15-19=11.3% 20-29=53% >30=35.7%	AND	DSM-IV	AND=9.9;	Unmarried Low SES Unplanned pregnancy History of complications Previous pregnancy loss	RR=1.34; 1.14-1.58 RR=1.30; 1.13-1.50 RR=1.55; 1.43-1.69 RR=1.30; 1.18-1.43
Abuidhail et al (2014)	Jordan	Cross-sectional study	281	27.7 (±6.4)	AND (3T)	EPDS (≥13)	57	↓ Education Primiparous Satisfaction with life Perceived stress Stressful relationship	β=-0.21, p<0.05 β=0.06, p<0.05 β=-0.37. p<0.01 β=0.17, p<0.01 β=0.20, p<0.01
Stewart et al (2014)	Malawi	Cross-sectional study	599	25.14 (±6.2)	AND	SRQ; DSM)-IV	Minor depression=10.7 ; Major Depression=21.1	↓ Social support Unplanned pregnancies Father's support Intimate partner violence Previous pregnancy complications Primigravida	OR=0.90; 0.85-0.96 OR=0.94; 0.31-2.82 OR=0.25; 0.04-1.51 OR=19.0;5.76-62.7 OR=0.25; 0.03-1.97 0.33;0.06-1.82
Chojenta et al (2014)	Australia	ALSWH Perinatal Mental Health (PNMH) sub-study cohort study	584	18-23 years	AND	Survey 2;3;5	AND=8.9 PPD=12.5	History of miscarriage	aOR= 1.75; 1.11-2.76
Jeong et al (2013)	Korea	Community based cross-sectional study	1262	31.65 (±3.39)	AND (1T/2T/3T)	EPDS (≥10) SRQ	1T=7.1 2T=59 3T=33.6	Relationship with partner Poor relationship with mother Support for past experiences	OR=2.23; 3.37-3.62 OR=1.43; 1.26–1.62 OR=1.52; 1.32–1.74
Dibaba et al (2013)	Ethiopia	Community-based cohort study	627	26 (±5.02)	AND	EPDS (≥13)	AND=19.9	Social support Food insecurity Physical violence	aOR=0.27;0.14-0.53 aOR=4.6; 2.75-7.70 aOR=3.4; 1.18-9.10
Yanikkerem et al (2013)	Turkey	Hospital-based study	651	NA	AND	BDI (≥17)	AND =10.9	↓ Education ↓ social support	β=-0.152; -2.22- -0.760 β=0.099; 0.707-4.135

Continued.

Authors (years)	Country	Study design	Sample size	Mean, median and age category	TOA	SC (TV)	AND (%)	Risk factors	Results
Fisher et al (2013)	Viet Nam.	Population-based study	523	—	AND	EPDS (≥12)	CMD=22.4 (early pregnancy); CMD=10.7 (late pregnancy)	Miscarriages Childhood abuse Life adversity Intimate partner violence Economic difficulty index	RR=2.5; 1.1-5.4 RR=2.6; 1.1-8 RR=9;4.2-19.3 RR=2.1; 1.5-2.9 RR=1.4; 1.1-1.9
Ajinkya et al (2013)	Navi Mumbai, India	Hospital based cross-sectional study	185	27.30 (±3.16)	AND	BDI (≥17)	AND=9.18	Previous history of obstetric complications Unplanned pregnancy Multiggravidas	P<0.0001 P=0.0019 P=0.0092
Gong et al (2013)	China	C-ABC prospective longitudinal cohort study	20,308	26.49 (±3.33)	AND (1T)	SAS CES-D	NA	Inter-pregnancy interval History of miscarriage	OR= OR=2.030; 1.509-2.730
Balestrieri et al (2012)	Italy	Hospital based cross-sectional study	1608	32.2 (± 4.8)	First USG	EPDS (≥13)	Possibly depressed=8.3, Probably depressed=4.7	Housewives Cohabitation History of depression	OR=0.91; 0.35–1.471 OR=2.31;1.003–3.624 OR=2.87; 2.22–3.52
Manikkam et al (2012)	South Africa	Hospital based study	387	27 (±6.1)	ANP	EPDS	38.50	Single marital status Unplanned pregnancy History of depression Thoughts of self-harm	P=0.04 P=0.01 P=0.02 P≤0.001
Giardinelli et al (2012)	Italy	Hospital based Follow-up study	590	34 (±4.2)	28th & 32nd weeks GA	EPDS (≥10) DSM-IV STAI-Y	AND=21.9 ANA=20.5 PPD=13.2	Conflicts with family Conflict with partner Life-time psychiatric disorder	OR=2.68; 1.68-4.29 OR=4.20; 1.97-8.95 OR=3.11;1.45-6.66
Ali et al (2012)	Pakistan	Hospital based cross-sectional study	165	<30=34.2% ≥30=20%	AND	HADS (≥8)	70	Decision making	P=0.013
Nasreen et al (2011)	Bangladesh	Community based cross-sectional study	720	24.58 ±6.15	AND (3T)	EPDS (≥10)	AND=18 ANS=29	Low education Forced sex Physical violence History of depression Poor relationship with partner	OR= 0.59;0.37-0.95 OR=1.95; 1.01-3.75 OR=1.69; 1.02-2.80 OR=4.62; 2.72-7.85 OR=2.23; 3.37-3.62

Continued.

Authors (years)	Country	Study design	Sample size	Mean, median and age category	TOA	SC (TV)	AND (%)	Risk factors	Results
Husain et al (2011)	Urban Pakistan	Cross-sectional study	1,357	—	AND	EPDS SRQ-20 BDQ	AND=38.3	Stressful life event	_

1T- first trimester; 2T- second trimester; 3T- third trimester; TOA- time of assessment; SC: screening tool; TV- threshold value; AND- antenatal depression; ANA- antenatal anxiety- postpartum depression; EDPS- edinburgh postnatal depression scale; HDRS- hamilton depression rating scale; SRQ-10- self reporting questionnaire; BDQ- becks depression questionnaire; STAI- state trait anxiety inventary; USG- ultrasound sonography; DSM- diagnostic and statistical manual; SCID- DSM-IV- structured clinical interview for DSM-IV; WE-Western Europeans; ME-Middle Easterners; SA-South Asians; NA- not available
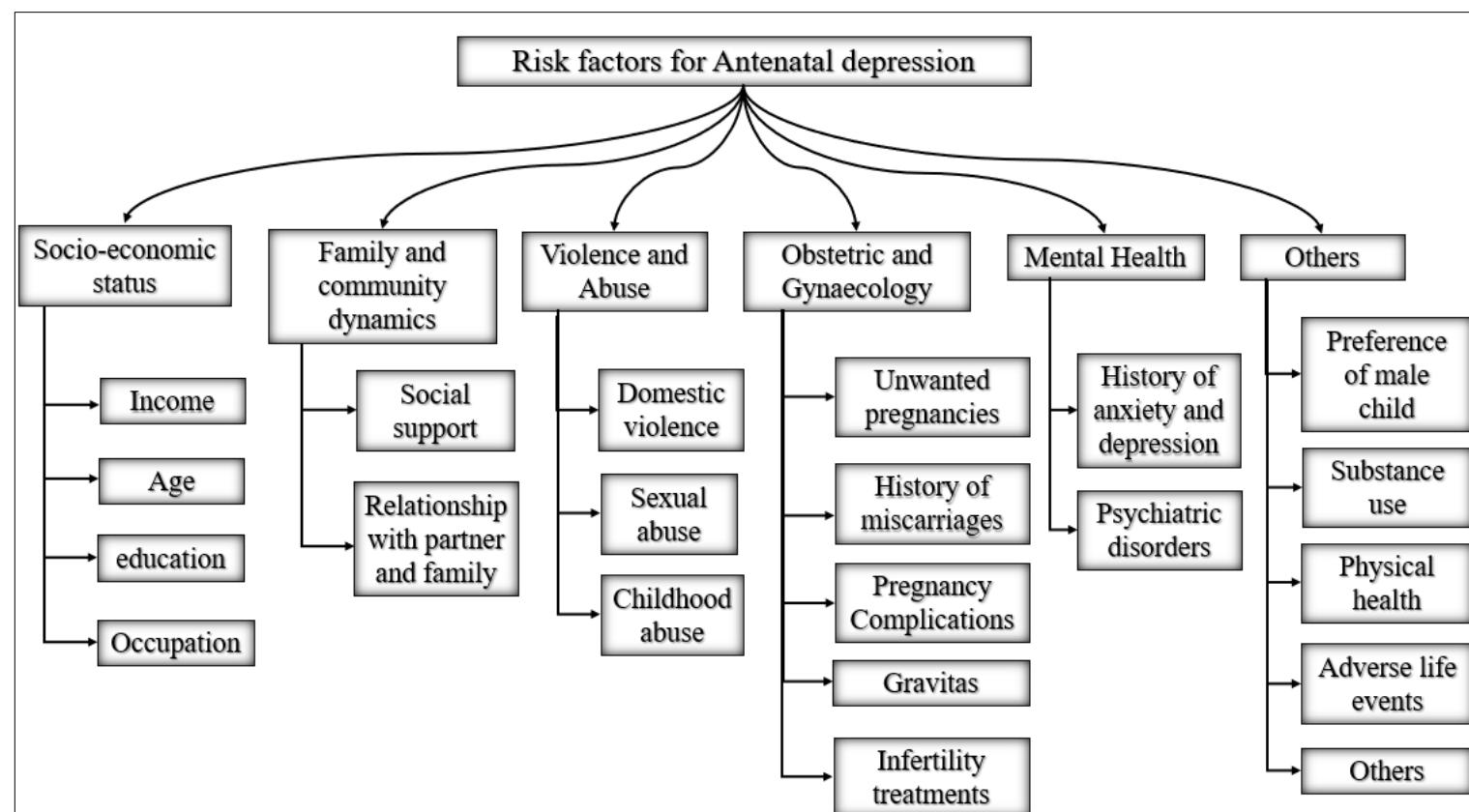
Figure 2: Potential risk factors of ante-natal depression.

Factors such as low education levels, economic dependence, and substance abuse, particularly alcohol misuse by male partners, further compound women's vulnerability. Additionally, intergenerational trauma, where perpetrators have themselves been exposed to violence in childhood, perpetuates a cycle of abuse.[55] Addressing IPV is essential for improving maternal mental health. Routine IPV screening in antenatal care, trauma-informed healthcare training, and community programs that challenge harmful gender norms are critical interventions. Broader structural solutions, such as legal reforms, girls' education, economic empowerment, and public awareness campaigns, are equally vital to breaking the cycle of violence and promoting healthier futures for mothers and their children.

Obstetrics and gynaecology

Unintended pregnancies

Overall, 19% unintended pregnancies have been reported among six South Asian countries, of which those in India & Bangladesh ranged between 11.9% to 28.4%. The psychological burden of unintended pregnancies particularly during antenatal period and in later stages of life adversely shapes the personality of the affected individuals and their next generation.[56] The epidemiological evidence suggests that the women with unintended pregnancies have greater risk of adverse pregnancy outcomes than women with intended pregnancies.[57]

There are consistent reports that the unplanned pregnancies are strong predictors of AND suggesting that the women with unplanned pregnancies were more likely to experience severe and moderate depressive symptoms compared to those with planned pregnancies.[56,57] Bayrampour et al supported these findings, indicating that unplanned pregnancies independently and significantly increased the risk of AND [aOR=3.05;95% CI 1.61-5.79].[49] Studies conducted in African populations, including Ethiopia and KwaZulu-Natal, further confirmed the association between unplanned pregnancies and increased odds of AND (38.50%-point prevalence of AND, p=0.01), [aOR 1.52; 95% CI 1.04- 2.21].[41,52] A prospective cohort study on 2072 mothers in Malaysia, revealed that the women who were happy with their pregnancies and those with planned pregnancies had lower likelihoods of experiencing AND [OR 0.45; 95% CI 0.33-0.60].[31] Furthermore, unplanned pregnancy was identified as an important risk factor for AND in studies conducted in various regions highlighting the global impact of pregnancy planning on maternal mental health.[41] Orr et al evaluated the association between intention of pregnancy and preterm birth in a large prospective cohort and found that unintended pregnancy was associated with preterm delivery ([aRR 1.82, 95 % CI 1.08–3.08, p=0.026).[58] Thus, interventions related to the counselling for family planning for better awareness on reproductive health and facilitation of informed decision making by individual mothers,

couples, families and societies as a whole, may be designed to combat the burden of AND.

Gravida

Gravida, indicates the number of times the woman has been pregnant, regardless of whether these pregnancies were carried to term, and including the current pregnancy. Studies have found that the number of pregnancies and inter-pregnancy intervals are significant predictors of AND, A hospital-based study conducted in South India, revealed that women with more than four pregnancies had a significantly higher risk of experiencing depressive symptoms during pregnancy [OR=5.54; 95% CI 0.9-31.1], emphasizing the importance of considering gravidity in maternal mental health care.[25] Similarly, in a study in Nepal found that multigravida women were more likely to experience AND compared to primiparous mothers (aOR=2.21; 1.11-4.42).[27] Furthermore, studies conducted in Jordan and China found significant differences in AND scores between primiparous and multiparous women, suggesting that the value in considering parity while determining the risk of AND.[37,59] Additionally, inter-pregnancy interval was identified as a contributing factor to AND, women with shorter inter-pregnancy intervals being at higher risk of depression. For instance, a Chinese study had revealed that women with an inter-pregnancy interval of 7-12 months and history of miscarriage had a significantly higher risk of depression.[59] Thus, literature indicates towards the importance of considering obstetric history, and inter-pregnancy intervals in assessing the risk of depression among pregnant women and designing targeted interventions to support maternal mental health during pregnancy.

History of miscarriage, abortion and other birth complications

The depressive symptoms during pregnancy can be manifested due to adverse gestational complications. The studies have found that the reproductive history and pregnancy complications are the risk factors for AND. The women with a history of had increased odds of experiencing depressive symptoms during pregnancy [OR 1.86; 95% CI 1.30-2.66], miscarriage [aOR 1.75; 95% CI 1.11-2.76].[32,60] Similarly, previous pregnancy loss, including miscarriage and abortion, were strongly associated with AND [aOR 5.13; 95% CI 2.42-10.85], [RR 1.30; 95% CI 1.18-1.43], [OR 2.83, 95% CI 1.3-6.2]).[25,52,56] Complications during pregnancy [OR 3.01, 95% CI 1.6-5.6] and irregular menstrual history [OR 2.98; 95% CI 1.64-5.40], are also associated with AND.[25,32]

The history of previous miscarriages, stillbirths, and pregnancy complications emerged as risk factors for AND in a study conducted in Pakistan, showed the importance of addressing past reproductive experiences in maternal mental health care. This highlights the need for holistic interventions addressing both physical and psychological

aspects of maternal health as crucial for promoting mental health and well-being of pregnant women.[53]

Psychological risk factors

AND is shaped by a complex interplay of psychological risk factors, including prior psychiatric history, personality traits, and pregnancy-related stressors. Evidence consistently demonstrates that depression and anxiety during pregnancy are associated with adverse maternal and child health outcomes such as inadequate weight gain, poor prenatal care, substance use, preterm birth, and low birth weight (Marcus, 2009).[62] The timing and severity of depressive symptoms are also linked to more severe outcomes.[49]
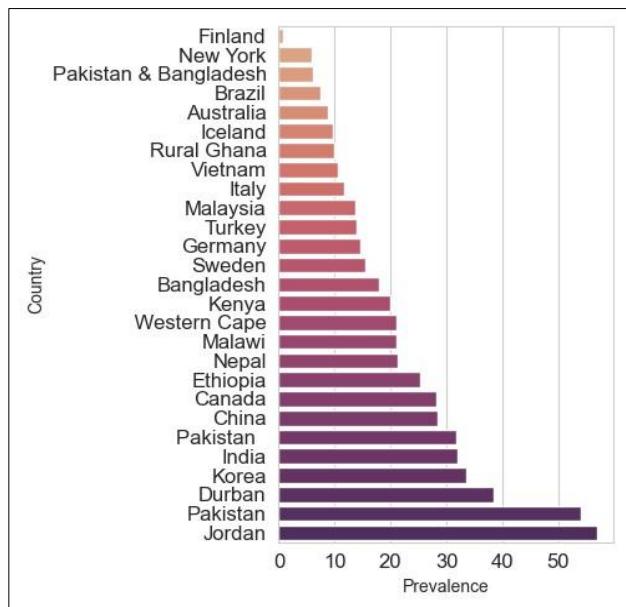
Figure 3: Country-wise prevalence of antenatal depression.

A significant predictor of AND is a personal history of psychiatric illness. Studies have found that women with previous episodes of depression or anxiety are at considerably higher risk of experiencing AND. For example, Rubertsson et al reported that women with prior depression [OR 3.8] or anxiety [OR 5.2] had increased anxiety symptoms during early pregnancy.[47] Similarly, other studies have found that a prior history of depression strongly predicts AND, with odds ratios ranging from 2.87 to 4.62.[30,40,43] A history of emotional problems, comorbid anxiety, and stressful life events also contribute significantly to elevated depressive symptoms.[35]

Anxiety itself is both a risk factor and a common co-occurring condition with AND. Sheeba et al noted that high anxiety levels during pregnancy correlate with increased AND. Personality traits such as psychoticism [OR 1.06] and neuroticism [OR 1.07] have also been associated with antenatal anxiety and depression.[29,32] Moreover, psychiatric conditions before or during

pregnancy increase the likelihood of both antenatal and postnatal anxiety and depression.[34,42]

Fear of childbirth is another notable psychological risk. It is significantly associated with anxiety and AND [OR 3.0], and even major depression [aOR 2.63].[47,61] However, protective factors such as delivery preparedness and positive pregnancy experiences have been found to reduce AND risk.[32,63] These findings emphasize the need for early psychological screening and tailored interventions during antenatal care to support maternal mental health.
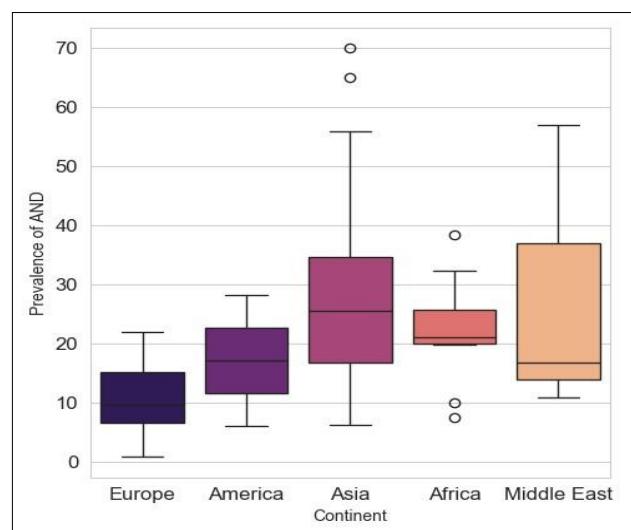

Figure 4: Continent-wise prevalence of antenatal depression.

Socio-demographic risk factors

The marital status, employment, and income level emerged as notable contributors to the AND, as reported by studies conducted in Ethiopia and Germany.[28] Furthermore, demographic factors such as younger maternal age [OR 0.85; 95% CI 0.76-0.95] and lower education level [OR 1.6; 95% CI 1.1–2.3] were identified as protective factor in study from China and as risk factors in a study from Sweden, respectively.[32,47] Social and economic determinants, including unemployment, financial strain, and low household wealth, also played pivotal roles in predicting AND, as evidenced by research from Italy and India.[26,63] Additionally, studies from Turkey and Jordan emphasized the significance of education level in relation to AND risk [(β=-0.21, p<0.05), (β=-0.152; -2.22-0.76)].[37,50] Understanding this multifaceted landscape of socio-demographic factors is crucial for identifying vulnerable populations and promoting targeted interventions to support women during pregnancy.

Others multifaceted risk factors

Beyond psychological and social determinants, several additional multifaceted risk factors contribute to antenatal depression (AND). A study in Jordan identified smoking

and drug use as significant contributors, while a preference for male children increased the odds of AND in Nepal [aOR 2.53; 95% CI: 1.20–5.32].[37,27] Poor physical health, both before and during pregnancy, has been linked to chronic depressive symptoms, as evidenced by studies in Canada and Oslo.[30,49] Physical symptoms related to pregnancy also elevate AND risk, as noted in South India and Turkey.[26,50]

Reproductive health issues, such as the use of oral contraceptives prior to pregnancy and prolonged infertility treatments, further increase vulnerability to depression.[31] Unlike other causes, AND linked to obstetric factors may not persist postpartum and can often be mitigated with targeted psychosocial support and quality prenatal care.[60] Public health interventions addressing parity, age at pregnancy, and pregnancy intervals can reduce risk.[56] A comprehensive strategy including stigma reduction, improved mental health access, and culturally sensitive care is essential for addressing these disparities.

DISCUSSION

This review highlights AND as a globally prevalent and multifactorial condition, with notable variation across countries and continents reflecting differences in socio-cultural norms, health systems, and methodological approaches.[2,23-48] The burden of AND appeared particularly pronounced in Asian and African studies, which together accounted for the majority of included evidence, often reporting higher prevalence and stronger associations with social adversity, unintended pregnancy, and intimate partner violence.[23-48] In South Asian countries such as Pakistan, India, Nepal, and Bangladesh, AND was strongly shaped by patriarchal family structures, son preference, high gravidity, unplanned pregnancies, and limited decision-making autonomy, suggesting an urgent need for gender-sensitive antenatal care, strengthened family planning services, and partner-inclusive mental health interventions. African studies, particularly from Ethiopia, Kenya, and South Africa, consistently demonstrated high AND prevalence in contexts marked by poverty, IPV, and limited access to mental health services, underscoring the importance of integrating routine mental health and violence screening into primary antenatal care and strengthening community-based psychosocial support systems.[23-48]

In contrast, studies from Europe and Canada generally reported lower prevalence but identified prior psychiatric history, anxiety, and relationship stress as dominant predictors, indicating that even in high-income settings, AND remains closely linked to psychological vulnerability and relational factors rather than material deprivation alone.[30,49] These findings support the need for early mental health screening and continuity of care for women with known psychiatric histories in well-resourced health systems. Middle Eastern studies highlighted the role of education level, smoking, and reproductive stressors, reflecting transitional social contexts where traditional

norms intersect with changing lifestyles, suggesting that culturally tailored health education and behavioral risk reduction strategies may be particularly beneficial.[50-52]

Across regions, methodological heterogeneity in diagnostic tools and thresholds complicates direct prevalence comparisons; however, the consistent identification of social support, violence exposure, and reproductive autonomy as central determinants suggests shared global pathways to AND.[32,34,44,47,49] Collectively, these findings emphasize that region-specific strategies such as addressing gender norms and fertility pressures in South Asia, strengthening primary mental health care and IPV response in Africa, and prioritizing psychological screening and continuity of care in high-income countries are essential. A coordinated global approach that allows for local adaptation, supported by culturally validated screening tools and integrated maternal mental health policies, is critical for reducing the burden of AND and improving intergenerational health outcomes.

CONCLUSION

AND is a prevalent and complex condition driven by interacting psychological, obstetric, social, and structural factors. Despite regional variation in prevalence and risk profiles, consistent determinants across countries include poor social and partner support, exposure to violence, unintended pregnancy, adverse obstetric history, and prior mental health problems. Women in low- and middle-income settings, particularly in South Asia and Africa, experience a disproportionate burden due to compounded social and gender-based vulnerabilities. These findings highlight the need for routine, culturally appropriate mental health screening within antenatal care, alongside integrated interventions addressing reproductive health, violence prevention, and social support, to improve maternal and intergenerational outcomes.

REFERENCES

1. O'Hara MW, McCabe JE. Postpartum depression: current status and future directions. Annu Rev Clin Psychol. 2013;9:379-407.
2. Fisher J, Tran T, Tran TD, Dwyer T, Nguyen T, Casey GJ, et al. Prevalence and risk factors for symptoms of common mental disorders in early and late pregnancy in Vietnamese women: a prospective population-based study. J Affect Disord. 2013;146(2):213-9.
3. Woody CA, Ferrari AJ, Siskind DJ, Whiteford HA, Harris MG. A systematic review and meta-regression of the prevalence and incidence of perinatal depression. J Affect Disord. 2017;219:86-92.

4. Waqas A, Raza N, Lodhi HW, Muhammad Z, Jamal M, Rehman A. Psychosocial factors of antenatal anxiety and depression in Pakistan: is social support a mediator? PLoS One. 2015;10(1):e0116510.

5. Dadi AF, Miller ER, Mwanri L. Antenatal depression and its association with adverse birth outcomes in low- and middle-income countries: a systematic review and meta-analysis. PLoS One. 2020;15(1):e0227323.

6. Freeman MP. Pregnancy and psychiatric disorders. J Clin Psychiatry. 2013;74(4):373-4.

7. Wang Y, Gu J, Zhang H, Xu X. Path analysis of influencing factors for maternal antenatal depression in the third trimester. Sci Rep. 2024;14(1):55355.

8. Yin X, Sun N, Jiang N, Xu X, Gan Y, Zhang J, et al. Prevalence and associated factors of antenatal depression: systematic reviews and meta-analyses. Clin Psychol Rev. 2021;83:101932.

9. Mitchell R, Gordon A, Lindquist A, Walker SP, Homer CSE, Middleton A, et al. Prevalence of perinatal depression in low- and middle-income countries: a systematic review and meta-analysis. JAMA Psychiatry. 2023;80(5):425-31.

10. Arvind BA, Gururaj G, Loganathan S, Amudhan S, Varghese M, Benegal V, et al. Prevalence and socioeconomic impact of depressive disorders in India: multisite population-based cross-sectional study. BMJ Open. 2019;9(6):e027250.

11. Sahoo S, Gill G, Sikka P, Nehra R. Antenatal depression and anxiety in Indian women: a systematic review. Ind Psychiatry J. 2023;32(2):222-33.

12. Okagbue HI, Adamu PI, Bishop SA, Oguntunde PE, Opanuga AA, Akhmetshin EA. Systematic review of prevalence of antepartum depression during the trimesters of pregnancy. Open Access Maced J Med Sci. 2019;7:1555-60.

13. Bennett HA, Einarson A, Taddio A, Koren G, Einarson TR. Prevalence of depression during pregnancy: systematic review. Obstet Gynecol. 2004;103(4):698-709.

14. Anastopoulos AD, Smith TF, Garrett ME, Morrissey-Kane E, Schatz NK, Sommer JL, et al. Self-regulation of emotion, functional impairment, and comorbidity among children with ADHD. J Atten Disord. 2011;15(7):583-92.

15. Slomian J, Honvo G, Emonts P, Reginster JY, Bruyère O. Consequences of maternal postpartum depression: a systematic review of maternal and infant outcomes. Womens Health (Lond). 2019;15:1745506519844044.

16. Gavin NI, Gaynes BN, Lohr KN, Meltzer-Brody S, Gartlehner G, Swinson T. Perinatal depression: a systematic review of prevalence and incidence. Obstet Gynecol. 2005;106(5 Pt 1):1071-83.

17. Howard LM, Molyneaux E, Dennis CL, Rochat T, Stein A, Milgrom J. Non-psychotic mental disorders in the perinatal period. Lancet. 2014;384(9956):1775-88.

18. Shorey S, Chee CYI, Ng ED, Chan YH, Tam WWS, Chong YS. Prevalence and incidence of postpartum depression among healthy mothers: a systematic review and meta-analysis. J Psychiatr Res. 2018;104:235-48.

19. O'Connor E, Rossom RC, Henninger M, Groom HC, Burda BU. Primary care screening for and treatment of depression in pregnant and postpartum women. JAMA. 2016;315(4):388-406.

20. Radoš SN, Matijaš M, Matijaš T, Šunjić M, Dotlić J. Anxiety during pregnancy and postpartum: course, predictors and comorbidity with postpartum depression. Acta Clin Croat. 2020;59(3):447-55.

21. Leigh B, Milgrom J. Risk factors for antenatal depression, postnatal depression and parenting stress. BMC Psychiatry. 2008;8:24.

22. Goodman JH, Tully KP. Recurrence of depression during pregnancy: the role of antidepressants. Depress Anxiety. 2009;26(7):698-701.

23. Roy U, Swain D. A prospective cohort study to assess the prevalence and risk factors of antepartum depression and its effect on maternal and fetal outcome. Asian J Psychiatr. 2024;91:103873.

24. Insan N, Forrest S, Jaigirdar A, Islam R, Rankin J. Social determinants and prevalence of antenatal depression among women in rural Bangladesh: a cross-sectional study. Int J Environ Res Public Health. 2023;20(3):2364.

25. Nisarga V, Anupama M, Madhu KN. Social and obstetric risk factors of antenatal depression: a cross-sectional study from South India. Asian J Psychiatr. 2022;72:103063.

26. Prabhu S, Guruvare S, George LS, Nayak BS, Mayya S. Prevalence and associated risk factors of antenatal depression among pregnant women attending tertiary care hospitals in South India. Depress Res Treat. 2022;2022:9127358.

27. Chalise A, Shrestha G, Paudel S, Poudyal AK. Antenatal depression and its associated factors among women of Godawari Municipality, Lalitpur, Nepal. BMJ Open. 2022;12(11):e063513.

28. Mirieri HK, Mweu MM, Olenja JM. Determinants of prenatal depression among women attending antenatal clinic at a referral facility in Mombasa County, Kenya: a case-control study. F1000Res. 2020;9:36.

29. Sheeba B, Nath A, Metgud CS, Krishna M, Venkatesh S, Vindhya J, et al. Prenatal depression and its associated risk factors among pregnant women in Bangalore. Front Public Health. 2019;7:108.

30. Shakeel N, Eberhard-Gran M, Sletner L, Slinning K, Martinsen EW, Holme I, et al. Depression in pregnancy: prevalence and risk factors in a multi-ethnic population. BMC Pregnancy Childbirth. 2015;15:5.

31. Mohamad Yusuff AS, Tang L, Binns CW, Lee AH. Prevalence of antenatal depressive symptoms among women in Sabah, Malaysia. J Matern Fetal Neonatal Med. 2016;29(7):1170-4.

32. Zeng Y, Cui Y, Li J. Prevalence and predictors of antenatal depressive symptoms among Chinese women in their third trimester. BMC Psychiatry. 2015;15:66.

33. Srinivasan N, Murthy S, Singh AK, Upadhyay V, Mohan SK, Joshi A. Assessment of burden of depression during pregnancy among rural women in Chennai. J Clin Diagn Res. 2015;9(4):LC08-12.

34. Akçali Aslan P, Aydin N, Yazici E, Aksoy AN, Kirkan TS, Daloglu GA. Prevalence of depressive disorders and related factors in first-trimester pregnancies. Int J Soc Psychiatry. 2014;60(8):809-17.

35. Verreault N, da Costa D, Marchand A, Ireland K, Dritsa M, Khalifé S. Rates and risk factors of depressive symptoms during pregnancy and postpartum onset. J Psychosom Obstet Gynaecol. 2014;35(3):84-91.

36. Lydsdottir LB, Howard LM, Olafsdottir H, Thome M, Tyrfingsson P, Sigurdsson JF. Mental health characteristics of pregnant women with depressive symptoms. J Clin Psychiatry. 2014;75(4):393-8.

37. Abujilban SK, Abuidhail J, Al-Modallal H, Hamaideh S, Mosemli O. Predictors of antenatal depression among Jordanian pregnant women. Health Care Women Int. 2014;35(2):200-15.

38. Jeong HG, Lim JS, Lee MS, Kim SH, Jung IK, Joe SH. Psychosocial factors and obstetric history associated with depression in pregnancy. Gen Hosp Psychiatry. 2013;35(4):354-8.

39. Dibaba Y, Fantahun M, Hindin MJ. Unwanted pregnancy, social support and depressive symptoms in pregnancy. BMC Pregnancy Childbirth. 2013;13:135.

40. Balestrieri M, Isola M, Bisoffi G, Calò S, Conforti A, Driul L, et al. Determinants of antepartum depression: a multicenter study. Soc Psychiatry Psychiatr Epidemiol. 2012;47(12):1959-65.

41. Manikkam L, Burns JK. Antenatal depression and its risk factors: an urban prevalence study. S Afr Med J. 2012;102(12):940-4.

42. Giardinelli L, Innocenti A, Benni L, Stefanini MC, Lino G, Lunardi C, et al. Depression and anxiety in the perinatal period. Arch Womens Ment Health. 2012;15(1):21-30.

43. Nasreen HE, Kabir ZN, Forsell Y, Edhborg M. Depressive and anxiety symptoms during pregnancy in rural Bangladesh. BMC Womens Health. 2011;11:22.

44. Marchesi C, Ampollini P, Paraggio C, Giaracuni G, Ossola P, de Panfilis C, et al. Risk factors for panic disorder in pregnancy. J Affect Disord. 2014;156:134-8.

45. Joshi D, Shrestha S, Shrestha N. Antepartum depressive symptoms and risk factors in Nepal. PLoS One. 2019;14(4):e0214992.

46. Abebe M, Asgedom YS, Gebrekidan AY, Tebeje TM. Antenatal depression among pregnant women in Ethiopia: an umbrella review. PLoS One. 2025;20(1):e0315994.

47. Rubertsson C, Hellström J, Cross M, Sydsjö G. Anxiety in early pregnancy: prevalence and contributing factors. Arch Womens Ment Health. 2014;17(3):221-8.

48. Ali NS, Azam IS, Ali BS, Tabbusum G, Moin SS. Frequency and associated factors for anxiety and depression in pregnant women. Sci World J. 2012;2012:653098.

49. Bayrampour H, McDonald S, Tough S. Risk factors of transient and persistent anxiety during pregnancy. Midwifery. 2015;31(6):582-9.

50. Yanikkerem E, Ay S, Mutlu S, Goker A. Antenatal depression: prevalence and risk factors in a hospital-based Turkish sample. J Pak Med Assoc. 2013;63(4):472-7.

51. Stewart RC, Umar E, Tomenson B, Creed F. Antenatal depression and associated factors in Malawi. Arch Womens Ment Health. 2014;17(2):145-54.

52. Tiki T, Taye K, Duko B. Depression among pregnant mothers in West Shoa zone, Ethiopia. Ann Gen Psychiatry. 2020;19:30.

53. Ajinkya S, Jadhav P, Srivastava N. Depression during pregnancy: prevalence and obstetric risk factors. Ind Psychiatry J. 2013;22(1):37-40.

54. Karmaliani R, Asad N, Bann CM, Moss N, McClure EM, Pasha O, et al. Anxiety and depression among pregnant women in Hyderabad, Pakistan. Int J Soc Psychiatry. 2009;55(5):414-24.

55. Martini J, Petzoldt J, Einsle F, Beesdo-Baum K, Höfler M, Wittchen HU. Course patterns of anxiety and depressive disorders during pregnancy. J Affect Disord. 2015;175:385-95.

56. Weobong B, Soremekun S, ten Asbroek AHA, Amenga-Etego S, Danso S, Owusu-Agyei S, et al. Prevalence and determinants of antenatal depression in Ghana. J Affect Disord. 2014;165:1-7.

57. Fellenzer JL, Cibula DA. Intendedness of pregnancy and predictors of prenatal depression. Matern Child Health J. 2014;18(10):2426-36.

58. Orr C, Spechler P, Cao Z, Albaugh M, Chaarani B, Mackey S, et al. Grey matter volume differences associated with low levels of cannabis use. J Neurosci. 2019;39(10):1817-27.

59. Gong X, Hao J, Tao F, Zhang J, Wang H, Xu R. Pregnancy loss and anxiety and depression in subsequent pregnancies. Eur J Obstet Gynecol Reprod Biol. 2013;166(1):30-6.

60. Chojenta C, Harris S, Reilly N, Forder P, Austin MP, Loxton D. History of pregnancy loss and mental health in subsequent pregnancies. PLoS One. 2014;9(4):e95038.

61. Räisänen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Risk factors and perinatal outcomes of major depression during pregnancy. BMJ Open. 2014;4(11):e004883.

62. Marcus SM. Depression during pregnancy: rates, risks and consequences. Can J Clin Pharmacol. 2009;16(1):e15-22.

63. Agostini F, Neri E, Salvatori P, Dellabartola S, Bozicevic L, Monti F. Antenatal depressive symptoms and social support among Italian women. Matern Child Health J. 2015;19(5):1131-41.

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