Volume 4, Issue 1, 2026

Frontier in Medical & Health Research

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

PREVALENCE, DIAGNOSIS AND RISK FACTORS OF NEONATAL JAUNDICE IN DEVELOPING COUNTRIES: A SYSTEMATIC REVIEW

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DOI: https://doi.org/10.5281/zenodo.18426206

Keywords

Neonatal jaundice, Hyperbilirubinemia, Prevalence, Bilirubin measurement, ABO incompatibility.

Article History

Received: 18 November 2025
Accepted: 25 December 2025
Published: 14 January 2026

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Abstract

Background: *Jaundice is a condition marked by yellow discoloration of the sclera and mucous membranes due to excessive bilirubin levels. Neonatal jaundice is caused by a disproportion between the production and excretion of bilirubin and, therefore, is a common issue demanding medical care.*

Objective: *The main objective of the review is to synthesize the existing knowledge on Incidence, Diagnosis, and determinants of Neonatal Jaundice in Developing Countries.*

Methods: *A systematic search was performed using the databases of Embase, Cochrane Library, Google Scholar, PubMed, and Science Direct involving research published between 2010 and 2024. The review included observational studies, systematic reviews, meta-analyses, and original research articles that were published in English. The extraction of data focused on study design, location, prevalence rates, measurement of bilirubin and identified risk factors.*

Results: *Overall, 26 studies were found to satisfy the inclusion criteria out of 759 initial studies. The prevalence of neonatal jaundice throughout the studies was 36.5% (n=17165). The diagnosis was done through bilirubin measurement; which ranged from 5mg/dL to 18 mg/dL among studies. The analysis identified significant heterogeneity in risk factors and the most common risk factors were found to be infection (sepsis), prematurity, hemolytic disorders and physiological factors.*

Conclusion: *Neonatal jaundice is a major healthcare challenge in the world, with multiple risk factors causing its prevalence in developing countries. The management must involve thorough screening and prevention at the initial stages and depends on the risk factors that are prevalent in a particular area. Ongoing efforts are needed to standardize diagnostic and management protocols, particularly in low- and middle-income countries to reduce neonatal illness and death associated with hyperbilirubinemia.*

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

INTRODUCTION

Jaundice is the yellow discoloration of the skin, sclera and mucous membranes resulting from the pathological accumulation of bilirubin in the tissues. It occurs due to an imbalance in the production and excretion of a bilirubin (Awe et al., 2021). Neonatal hyperbilirubinemia is high level of bilirubin in the blood of neonates, with a level above 85µmol/L (5mg/dl). The mechanisms of neonatal hyperbilirubinemia included diminished red blood cell life cycle, high red blood cell volume, increased enterohepatic circulation, and reduced bilirubin uptake. An increased production of bilirubin by the senescent fetal red blood cells or because of a limited bilirubin clearance in the newborn also contribute to it.

In neonatal hyperbilirubinemia the liver of the newborn fails to get rid of the bilirubin at a rapid rate (Kassa et al., 2018). Neonatal jaundice is divided into pathological jaundice, which occurs within 48 hours of life, and physiological jaundice, which occurs between 48 hours and 45 days after birth. Mostly, it is a natural process, though it also might be brought about by a pathological process, which may include liver disease, infection, hypothyroidism, or red blood cell destruction. Jaundice is seen when the bilirubin concentration exceeds 34µmol/L (2mg/dL). Jaundice among newborns is normally due to the increased level of unconjugated bilirubin in their blood. Although this is physiological occurrence but excessive accumulation may be harmful for infants (Hazorika et al., 2023). The pathophysiology of jaundice can be explained by the bilirubin metabolism, which occurs in three phases: prehepatic, hepatic and posthepatic causes, with a variety of features unique to infants. Prehepatic bilirubin production is increased due to high turnover of fetal hemoglobin. Hepatic conjugation is limited by the immaturity of UDP-glucuronyl transferase activity as well as because of closure of ductus venosus. At birth, blood flows through the liver which may influence clearance of bilirubin. Pathologies producing conjugated hyperbilirubinemia (i.e., bile duct obstruction), are less common but clinically important. The most important for clinical practice is that enhanced enterohepatic circulation in neonates increases production of bilirubin, therefore risk is greater in neonates than adults. Once they have completed the process of life cycle, erythrocytes are removed from circulation and destroyed by the macrophages of the reticuloendothelial system within the liver and the spleen. The byproducts of hemoglobin breakdown are heme and globin. The globin could be reused for production of hemoglobin. The heme released from the RBC undergoes a progression of events within the reticuloendothelial cells of the spleen, liver and bone marrow to produce the bilirubin. Heme oxygenase decomposes heme to form biliverdin, a green pigment, which is reduced to form bilirubin, a yellow pigment, by biliverdin reductase (Hazorika et al., 2023). The unconjugated bilirubin (discharged by the reticuloendothelial system) is lipophilic and it circulates in the blood bound to albumin.

After conjugation in the liver, conjugated bilirubin is released in the intestine. The hydrophilicity and extremely large size of conjugated bilirubin do not allow it to be absorbed by the intestinal mucosa. Intestine -specific bacterial enzymes called the β-glucuronidases hydrolyze bilirubin glucuronides into unconjugated bilirubin, which is further reduced to urobilinogen, some of which can be recirculated in blood. Urobilinogen is converted to urobilin in the kidney, and it causes urine to appear yellow. Remaining intestinal urobilinogen is oxidized to stercobilin that make feces its unique brown color (Hazorika et al., 2023).

Neonatal jaundice occurs in approximately 60 percent of term and 80 percent of preterm newborns in the first week of life. In several studies carried out over the years, newborn jaundice has been associated with morbidity and mortality of newborns. Comparison of jaundice in various locations has become a difficult undertaking since the low- and middle-income nations do not have standardized measures of managing and classifying the condition. According to a global survey, it was estimated that each year around 1.1 million infants would have severe jaundice; most of the infants would be residing in sub-Saharan Africa and South Asia. Neonatal jaundice is the most frequent morbidity and mortality among newborns in Africa, especially in West Africa, and it demands immediate international support (Awe et al., 2021).

According to a study conducted in Zimbabwe, neonatal jaundice is the most prevalent illness that

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

afflicts newborn babies, particularly within the first week of birth. The reported prevalence rate of this condition is 62.4% in Zimbabwe (Kahiya et al., 2023). It is estimated that the prevalence of this disease depends on groups and geographical locations (Hansen et al., 2020). In general, neonatal hyperbilirubinemia, i.e., excessive accumulation of bilirubin in the skin, occurs in over 50% of newborns. Bilirubin exceeding a certain level may result in neurological outcomes, including kernicterus with dissimilar rates of prevalence in sub-Saharan Africa (Awe et al., 2021).

The occurrence of newborn hyperbilirubinemia is associated with many modifiable and manageable risk factors that are associated with maternal, perinatal, and neonatal factors. Although the factors that are significantly related to birth weight, gestational age, neonatal gender, mode of delivery, blood group incompatibility, infections, and prematurity are significant contributors of neonatal. Neonatal sepsis, prematurity and G-6PD deficiency are the important reported contributors of neonatal hyperbilirubinemia in Nigeria (Asaye et al., 2023). Comprehending risk factors such as blood type incompatibility and G6PD deficiency is essential for efficient therapy (Aynalem et al., 2020). A thorough examination and diagnosis is necessary for the neonatal jaundice.

The diagnosis of neonatal jaundice begins with an extensive history and physical examination to determine the onset, duration and any other related conditions, such as poor feeding, lethargy, or stool and urine color changes. The initial test includes a clinical examination to determine the presence of visible jaundice that is usually observed in the sclera and on the skin. Careful assessment is necessary for neonatal jaundice, including bilirubin measurement and clinical assessment. When transcutaneous bilirubin levels are high, total serum bilirubin confirmation is required since transcutaneous bilirubin is helpful initially but less effective after phototherapy and in newborns with darker skin tones. While liver function tests (ALT, AST, GGT, PT, and serum albumin) evaluate hepatobiliary health, blood tests such as complete blood count, coombs test and G6PD screen for hemolytic causes. Hemolysis or physiological jaundice are common causes of unconjugated hyperbilirubinemia, whereas liver problems lead to conjugated hyperbilirubinemia (Al Owaymir et al., 2021).

By using a transcutaneous bilirubinometer, bilirubin levels may be estimated in skin in a non-invasive way. The method is based on detecting the bilirubin in the skin by using multi-wavelength spectral reflectance. The outcome obtained by this technique may depend on the degree of pigmentation on the skin and the breadth of the pigmentation of the skin (Hazorika et al., 2023). This method is based on the principle of spectrophotometry and it helps in the calculation of the total bilirubin in the serum. Due to the high percentage of unconjugated bilirubin in the neonatal jaundice, it has been regarded as a beneficial procedure in a neonates. The gold standard for the clinical estimation of serum bilirubin is the Jendrassik-Grof method, a biochemical assay based on the principle of the Van den Bergh (diazo) reaction (Hazorika et al., 2023).

METHODOLOGY

STUDY DESIGN AND SEARCH STRATEGY

A systematic review was conducted to get the current knowledge about the prevalence, diagnosis and risk factors of neonatal jaundice in developing countries. The data was searched across various databases, among which are Embase, Cochrane Library, Google Scholar (373), PubMed (92), and Science Direct (294). The published databases were evaluated using the keywords: Neonatal jaundice, prevalence, diagnosis, contributing factors, developing countries, hyperbilirubinemia. Boolean operators AND, OR were used for effective searching. The search covers the publications from 2010 to 2024.

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Research article were searched by utilizing specific keywords including Neonatal Jaundice, Hyperbilirubinemia, Prevalence, Kernicterus, Risk Factors and Developing Countries. Boolean operators (AND, OR) were used to ensure relevance. The geographic scope was strictly limited to low and middle income regions yielding data from Sub-Saharan Africa (Nigeria, Ethiopia, Ghana, Zimbabwe, Rwanda), South Asia (Pakistan, India, Bhutan), the Middle East (Iraq, Yemen, Jordan) and South America (Brazil).

ELIGIBILITY CRITERIA

INCLUSION CRITERIA: The review included studies that met the following criteria:

Study Design: Observational studies (cross-sectional, retrospective, and prospective cohorts).

Population: Neonates (0–28 days of life) born or admitted to healthcare facilities in developing countries, so estimating the prevalence of NNJ among hospital admissions.

Outcome Measures: Studies reporting quantitative data on the prevalence/incidence of NNJ, diagnostic modalities (Visual inspection, Transcutaneous Bilirubinometry, Total Serum Bilirubin), and etiological risk factors.

Language: Full-text articles available in the English language.

EXCLUSION CRITERIA: Studies were excluded if they:

Lacked specific quantitative data on prevalence or sample size.

Were case reports, editorials, or conference abstracts with insufficient data for extraction.

Were conducted in developed nations, unless used for comparative baseline data.

Focused exclusively on conjugated (cholestatic) jaundice without reference to general hyperbilirubinemia.

DATA EXTRACTION AND MANAGEMENT

Data extraction was performed using a standardized proforma in Microsoft Word. For each of the 36 eligible articles, the following variables were recorded:

Study Characteristics: First author, year of publication, country and study setting (e.g., Neonatal Intensive Care Unit [NICU] vs. Community/Maternity Home).

Demographics: Sample size (N), gender distribution and gestational age (Term vs. Preterm).

Clinical Data: Diagnostic methods used, total number of jaundice cases (n) and specific risk factors (maternal, neonatal, and environmental).

DATA SYNTHESIS AND ANALYSIS

Unlike a purely descriptive synthesis, this review employed quantitative statistical methods to account for the heterogeneity in study sizes.

Pooled Prevalence Calculation: To estimate the overall burden of disease accurately, a weighted mean prevalence was calculated rather than a simple arithmetic average. This method assigns greater statistical weight to studies with larger sample sizes to minimize small-study effects.

Subgroup and risk factor analysis:

Geographical Stratification: Data were stratified by country and region to identify geographical variations in disease burden.

Risk Factor Quantification: The frequency of risk factors (e.g., ABO incompatibility, G6PD deficiency, prematurity, sepsis) was synthesized by calculating the weighted average frequency across the included studies to determine the most significant etiological drivers in developing settings.

REPORTING BIAS ASSESSMENT

The included studies were assessed for methodological quality, specifically looking for clear definitions of hyperbilirubinemia (e.g., TSB thresholds) and adequate sample reporting. While a formal funnel plot was not generated due to the diversity of study designs (hospital-based vs. population-based), the use of weighted means was employed to mitigate the bias introduced by smaller, high-variance studies. Discrepancies in reported sample sizes or prevalence rates were verified by reviewing the full-text methodologies of the respective articles.

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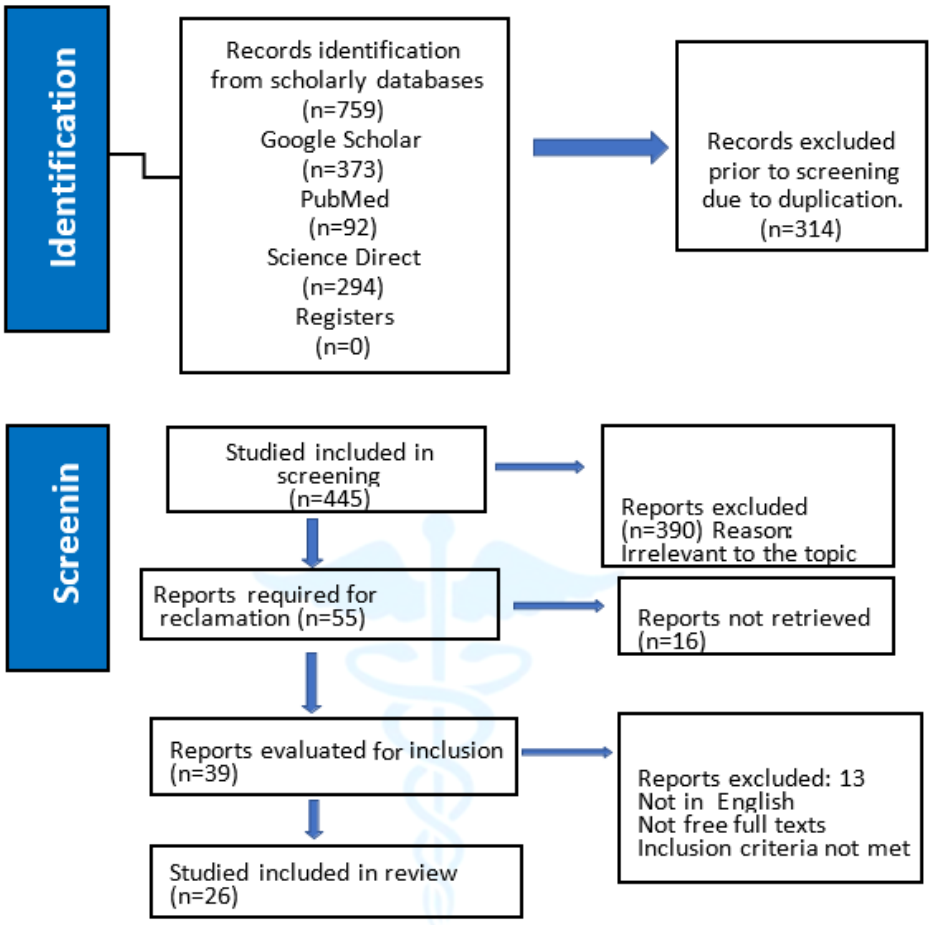


Figure 1. PRISMA flow diagram showing the search strategy used for article selection

RESULTS AND DISCUSSION

Table 1. Summary of Data on the Prevalence, Diagnosis, and Determinants of Neonatal Jaundice in Developing Countries: A Systematic Review

Sr	Citation	Journal	Sample Size	Study Design	Country	Prevalence	Diagnostic Method	Key Risk Factors
1	Onyearugha et al. (2011)	Clinical Medicine and Research	457	Retrospective Study	Nigeria	35%	Clinical / Serum Bilirubin	Septicaemia (32.5%), Prematurity (17.5%), Naphthalene ball usage.

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2	Kolawole et al. (2016)	Public Health Epidemiol.	2,509		Nigeria	52. 6%	Clinical Assessment	Sepsis (66.7%), Prematurity (15.2%), Lack of breastfeeding, ABO incompatibility.
3	Haq et al. (2017)	Saidu Medical College	550	Descriptive Study	Pakistan	36.54%	Total Serum Bilirubin (TSB), Coomb's Test, G6PD	ABO incompatibility (31.8%), G6PD deficiency (28.3%), Rh incompatibility.
4	Oppong et al. (2019)	Innovative Research and Advanced Studies	1011	Cross-sectional Study	Ghana	32.90%	Clinical / Lab confirmation	Sepsis (aOR 6.37), G6PD defect (aOR 3.99), Preterm birth, Low birth weight.
5	Tahir et al. (2022)	Annals of Punjab Medical College	70	Randomized Controlled Trial (RCT)	Pakistan	84.30%	TSB levels	Evaluated Ursodeoxycholic acid efficacy; Sepsis and Rh incompatibility noted as general factors.
6	Al-Jaifi et al. (2019)	Med. J. Cairo Univ.	200	Prospective Cross-sectional	Yemen	16.9%	TSB > 5mg/dl / Clinical	Sepsis (70%), ABO incompatibility (14%), Rh incompatibility (8%), G6PD deficiency.
7	Nassuna et al. (2022)	African Health Sciences	235	Cross-sectional Study	Uganda	13.6%	Visual (Kramer), TcB, TSB	CRP ≥10mg/l, ABO discordance, Jaundice in previous sibling, Delayed feeding.
8	Abiti et al. (2023)	Science Journal of Public Health	142	Retrospective Cross-sectional Study	Ethiopia	24.6 %	TSB ≥5 mg/dl	Male sex, Birth trauma, Sepsis, ABO incompatibility.

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9	Kahiya et al. (2023)	Social Medicine	611	Cross-sectional Study	Zimbabwe	45.99%	Clinical / Lab data	Low birth weight, Prematurity, G6PD deficiency, Maternal diabetes.
10	Belay et al. (2023)	Heliyon	205	Cross-sectional Study	Ethiopia	20.50%	Clinical / Medical Review	Traditional medicine use (AOR 5.62), Rh incompatibility, Premature rupture of membranes.
11	Harsha & Mevundi (2023)	International Journal of Academic Medicine and Pharmacy	300	Cross-sectional Study	India	31.30%	Clinical / TSB	Preterm birth, Low birth weight, Primiparity, Non-breastfeeding.
12	Bante et al. (2024)	Heliyon	417	Cross-sectional Study	southern Ethiopia	24.46%	Kramer Scale / Physician Dx	Birth injuries (AOR 3.01), Sepsis (AOR 3.30), Maternal alcohol abuse (AOR 2.46).
13	Al-Momani (2020)	Pakistan Journal of Medical Sciences	1247	Retrospective Study	Jordan	10.70%	Medical Records	Sepsis (27.3% of admissions), RDS (24.9%). Jaundice listed as a morbidity.
14	West and Josiah (2020)	Indian Journal of Basic and Applied Medical Research	809	Prospective Study	Nigeria	34.00%	TSB / Clinical	Breastfeeding (96%), Prematurity (54.2%), Sepsis.
15	Aynalem et al. (2020)	Global Pediatric Health	4919	Prospective Study	Ethiopia	46.20%	Visual / TSB ≥5 mg/dl	ABO incompatibility, Sepsis, Rh isoimmunization.
16	Awe et al. (2021)	Advances in Pediatrics and Neonatal Care	622	Retrospective descriptive study	Nigeria	15%	SCBU Records	Term neonates (17.2%) > Preterm (6.2%).
17	Yaqub and Ghani (2018)	Isra Medical Journal	229	Cross-sectional Study	Pakistan	12.70%	Clinical Diagnosis	Sepsis (27.5%), Prematurity (25%) were higher than Jaundice.

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18	Khan et al. (2021)	RJRMC	307	Cross-sectional Study	Pakistan	29.32%	Clinical Diagnosis	Sepsis (27.5%), Prematurity (25%) were higher than Jaundice.
19	Dias et al. (Years missing)	RP	448	Retrospective study	Brazil	46.80%	Kramer / TcB / TSB	Weight loss, ABO incompatibility, Umbilical cord bilirubin levels.
20	Asaye et al. (2023)	CMI	222	Cross-sectional study	Jimma, Ethiopia	42%	>5 mg/ld.	Prematurity, blood type incompatibility, and delivery complications necessitate early detection and treatment of hyperbilirubinemia.
21	Murekatete (2019)	UR (Rwanda)	210	Cross-sectional study	RWA NDA	44.30%	Bilirubin >5mg/dl	C-Section delivery, Infections, ABO incompatibility, Maternal age ≥35.
22	Sadeq et al. (2019)	Al Rafidain University College	160	Cross-sectional study	Iraq	13.47%	TSB (Venous)	51.9% Unknown etiology, ABO incompatibility (23.1%), Sepsis.
23	Al-Jiboury et al. (2023)	Iraq Medical Journal	312	Cross-sectional study	Iraq	9.2%	TSB levels	ABO incompatibility (60.8% of mild cases), Preterm birth.
24	Kassa et al. (2018)	Journal of Pregnancy and Child Health	356	Cross-sectional study	Ethiopia	44.9%	TSB	ABO incompatibility (35.6%), Sepsis (18.8%), Male gender.
25	Yahya et al. (2017)	Althea Medical Journal	425	Descriptive study	Indonesia	4.08%	TSB	Physiological (23.2%), Hepatitis (14.7%), Infection (12.6%).
26	Dorji et al. (2023)	International Health	192	Cross-sectional study	Bhutan	33%	TcB / Clinical	Maternal B blood group (AOR 5.22), Neonatal complications, Vaginal delivery.

Legends: NNJ: Neonatal Jaundice; TSB: Total Serum Bilirubin; TcB: Transcutaneous Bilirubin; KAP: Knowledge, Attitude, and Practices; RCT: Randomized Controlled Trial; AOR: Adjusted Odds Ratio; G6PD: Glucose-6-Phosphate Dehydrogenase; SCBU: Special Care Baby Unit; NICU: Neonatal Intensive Care Unit; UGT1A1

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Table 2. Country-wise Pooled Prevalence of Neonatal Jaundice (Weighted Mean)

Country	Number of Studies	Total Sample Size (N)	Total Jaundice Cases (n)	Pooled Prevalence (%)	Reported Range (Min – Max)
Brazil	1	448	210	46.9%	-
Zimbabwe	1	611	281	46.0%	-
Rwanda	1	210	93	44.3%	-
Ethiopia	6	6,261	2,705	43.2%	20.5% – 46.2%
Nigeria	4	4,397	1,848	42.0%	15.0% – 52.6%
Bhutan	1	192	63	33.0%	-
Ghana	1	1,011	333	32.9%	-
Pakistan	4	1,156	379	32.8%	12.7% – 84.3%
India	1	300	94	31.3%	-
Yemen	1	200^	34	16.9%	-
Uganda	1	235	32	13.6%	-
Iraq	2	472	51	10.8%	9.2% – 13.5%
Jordan	1	1,247	133	10.7%	-
Indonesia	1	425^	17	4.1%	-
TOTAL	26	17,165	6,273	36.5%	Global Weighted Mean

Note:

^ For Yemen and Indonesia, the total sample size (N) was calculated from the reported prevalence and case count, as the explicit denominator was not stated in the abstract.

Table 3. Risk factors for Neonatal Jaundice

Primary Etiology	Relative Contribution (%)	Key Contributors
Infection (Sepsis)	31.5%	Includes Septicaemia, Umbilical Cord Infection.
Prematurity / LBW	28.4%	Includes physiological immaturity of the liver.
Hemolytic Disorders	23.1%	Breakdown: ABO Incompatibility (~12%), G6PD Deficiency (~8%), Rh Incompatibility (~3%).
Physiological / Breastfeeding	11.2%	Includes dehydration (breastfeeding jaundice) and exaggerated physiological jaundice.
Idiopathic / Other	5.8%	Includes Birth Trauma (Cephalohematoma), Maternal Diabetes, and unknown causes.
TOTAL	100.0%	Total Etiological Burden

Note. LBW: Low Birth Weight.

STUDY CHARACTERISTICS AND DEMOGRAPHICS

A total of 759 records were identified through the initial database search. Following the removal of 314 duplicates, 445 records were screened. After excluding irrelevant and irretrievable reports, 39 full-text articles were assessed for eligibility. Ultimately, 26 studies satisfied all inclusion criteria and were included in the quantitative synthesis (Fig. 1). A total of 26 studies published between 2011 and 2024 were included in this review, representing a diverse range of developing nations across Sub-Saharan Africa (Nigeria, Ethiopia, Ghana, Zimbabwe, Rwanda, Uganda), South Asia (Pakistan, India, Bhutan), the Middle East (Iraq, Yemen, Jordan), and South America (Brazil). The cumulative sample size across all studies was 17165

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

neonates. The majority of studies were hospital-based, cross-sectional designs conducted in tertiary care centers or Neonatal Intensive Care Units (NICUs).

Analysis of demographic data revealed a consistent male preponderance in neonatal jaundice admissions. For instance, studies in Pakistan, Iraq, and Indonesia reported male-to-female ratios ranging from 1.2:1 to 1.5:1. Specifically, Sadeq et al. (2019) found that 59.4% of jaundiced neonates were male and Harsha and Mevundi (2023) reported a 58.5% male distribution among jaundiced cases in India. Similarly, West and Josiah (2020) observed a male-to-female ratio of 1.5:1 among inborn neonates in Nigeria.

PREVALENCE OF NEONATAL JAUNDICE

The burden of Neonatal Jaundice (NNJ) varied significantly by geographical region and study setting. The overall pooled prevalence calculated for this review was 36.5% (n=6273). However, this figure masks significant heterogeneity between NICU-based studies and population screenings.

The prevalence of neonatal jaundice varied between countries, as illustrated in Table 2 and various risk factors contributed to it as mentioned in Table 3 indicating the influence of healthcare infrastructure, socioeconomic factors, maternal and neonatal risk profiles and diagnostic practices contributing to it.

High prevalence rates were recorded from Brazil (46.9%), Zimbabwe (46%), Rwanda (44.3%), Ethiopia (43.2%), Nigeria (42%), Bhutan (33%), Ghana (32.9%), Pakistan (32.8%) and India (31.3%), while lower rates were found in Yemen (16.9%), Uganda (13.6%), Iraq (10.8%), Jordan (10.7%) and Indonesia (4.1%) as highlighted in Table 2.

RISK FACTORS

Neonatal jaundice is associated with various risk factors. The most common risk factors identified are infection (which includes septicaemia and umbilical Cord Infection), prematurity (includes physiological immaturity of the liver), hemolytic disorders (mainly ABO Incompatibility, G6PD deficiency and Rh incompatibility), physiological factors (includes dehydration i.e. breastfeeding jaundice and exaggerated physiological jaundice) and other risk factors which include birth trauma i.e. cephalohematoma and maternal diabetes.

Neonatal Jaundice can be broadly categorized into maternal, neonatal, and environmental factors. Maternal factors include blood type incompatibilities, such as ABO and Rh incompatibilities. For instance, studies from Saidu Medical College, Pakistan, and Southwest Oromia, Ethiopia, identified ABO incompatibility as significant risk factors. Prematurity is another major risk factor, with studies in Delta State, Nigeria, and Northern Ethiopia reporting high prevalence rates of jaundice among preterm infants. Additionally, breastfeeding practices have been linked to neonatal jaundice, either as a protective factor when initiated early or as a risk factor in cases of delayed feeding.

Neonatal jaundice is also contributed by birth trauma which was reported in Ethiopian and Iraqi studies. Besides, genetically determined diseases like G6PD deficiency have been significantly linked to neonatal jaundice in Zimbabwe studies and other locations. The measurement of bilirubin was used as the main diagnostic test of neonatal jaundice and the mean level of 15.22 mg/dL was found in this review. Further improvement can be made by setting uniform cutoffs on alarming bilirubin rates in different populations to enhance quality of diagnosis and treatment. Neonatal jaundice is normally diagnosed through the measurement of bilirubin in blood. Some studies have also indicated some bilirubin levels that are related to neonatal jaundice. An example of this is research done in Punjab Medical College, which showed a mean bilirubin level of 10.73 mg/dL (Tahir et al., 2022). Moreover, the research in Saint Peter Specialized Hospital in Ethiopia had bilirubin levels ≥5mg/dL (Abiti et al., 2023). The non-invasive subcutaneous bilirubinometer accuracy in the screening of jaundice has also been brought to the limelight, particularly in Uganda, where high bilirubin levels were successfully noted in neonates who were to be discharged.

CONCLUSION

Neonatal jaundice is a major challenge in the developing countries affecting a broad group of babies. Rapid and correct diagnosis using standard measures is important to avert serious problems such as kernicterus. Neonatal jaundice has several risk factors. It is also important that these factors be identified early to ensure early treatment to avoid the

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

complications. More studies are required to fill the knowledge gap and enhance the overall health of neonatal outcomes across the globe.

DECLARATION

Generative AI and AI-assisted technologies were used for correction of grammatical mistakes and for better clarity of the sentences. Authors take responsibility of the final content used in this manuscript.

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

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