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# **Determinants And Perceived Effects Of Neonatal Jaundice Among Newborns In The Special Care Baby Unit (SCBU) of the University of Calabar Teaching Hospital, Cross River State**

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## **ABSTRACT**

This study investigates the determinants and perceived effects of neonatal jaundice among newborns in the Special Care Baby Unit (SCBU) of the University of Calabar Teaching Hospital, Cross River State. Neonatal jaundice is a prevalent condition that poses significant health risks, including long-term neurological complications. The primary aim was to investigate the risk factors of Neonatal jaundice among new born in special care baby, identify clinical manifestations, preventive measures, and health implications associated with neonatal jaundice in this setting. A descriptive cross-sectional design was employed, utilizing structured questionnaires and clinical assessments involving healthcare professionals and caregivers of affected newborns. Quantitative data were analyzed using descriptive statistics to elucidate the perceptions of participants regarding jaundice management. The results revealed that yellowish discoloration of the eyes and skin were the most recognized clinical manifestations, with early diagnosis and effective use of phototherapy identified as crucial preventive measures. Participants highlighted the serious implications of poorly managed jaundice, including risks of brain damage and hearing loss. Additionally, family dynamics were adversely affected by the complications associated with neonatal jaundice. In conclusion, this study underscores the importance of timely intervention and education for healthcare professionals and caregivers. It is recommended that health systems implement routine screening and enhance educational programs focusing on the early detection and management of neonatal jaundice. Further research should explore the long-term outcomes of affected newborns and the impact of community awareness campaigns.

**Keywords:** neonatal jaundice, determinants, effects, health implications

## INTRODUCTION

Neonatal jaundice is a high burden to healthcare services worldwide, especially in low- economy and middle income countries like Ethiopia. (Slusher et al., 2017). It is the leading causes of neonatal mortality in the country. It is a major cause of hospital neonatal intensive care unit admissions during the neonatal period. Hence, the study is aimed to identify the determinants and effects of neonatal jaundice among new born in special care baby unit, University of Calabar Teaching Hospital Calabar.

Neonatal jaundice (NNJ) is a yellowish - orange discolouration of the skin, sclera and mucus membrane of the Neonates because of excessive bilirubin deposition (American Academy Of Paediatrics 2016). In newborns, jaundice appears when total bilirubin (TB) concentration is greater than or equal to 5mg/dl (85mmol/litre) (Kliegan, 2022). Hyperbilirubinemia with a total of 428-513umo/L is associated with an increased risk for bilirubin - induced neurological dysfunction with a significant risk of neonatal mortality and long term neurodevelopmental sequelea. (Maisels, 2015 ; Hameed 2017).

Hyperbilirubinemia can be described in the form of pathological, physiological, jaundice secondary to breast milk or breast feeding failure, and haemolytic jaundice due to glucose 6 dehydrogenase deficiency.( G6PD), ABO and Rh incompatibility.( Erdeve *et al.* , 2018). Jaundice can be severe when it is seen anywhere on the body on first day or the hands and feet in addition to the arms and legs on the next day. When jaundice is diagnosed, it can be manage by therapeutic interventions which include, phototherapy, exchange blood transfusion and improving the frequency and efficacy of feeding for inadequate formula feeding (Ullah *et al.* , 2016).

Globally 2.6 million newborn died in 2016 due to NNJ, out these death which occur in India, Pakistan, Nigeria and Ethiopia. More than 22% of neonate deaths were associated with the disease and bilirubin encephalopathy in which sub Saharan Africa and south Asia account for 35% and 39% of the deaths respectively (Bhuntani *et al*, 2019). Severe NNJ accounted for 2.8%of neonatal deaths in the UK, 30.8% in India, 34% in Nigeria and 14% in Kenya. Neonatal jaundice account for 75% of hospital admission in the first week of life and associated with significant mortality. (Ogunfoworo *et al*, 2019).

Different studies carried out reported that in an undeveloped countries, fetomaternal blood group incompatibilities are the leading cause of NNJ, but in developing countries, the cause is different as it is mostly prematurity, low birth weight, birth trauma, ABO incompatibility, sepsis as well as effects of herbal medication in pregnancy and application of dusting powder on the baby may result in Glucose-6-Phosphate Dehydrogenase (G6 PD) which is one of the most important causes of NNJ in Africa and Asia.( Garusi *et al*, 2016).

Determinants simply mean the factors responsible for neonatal jaundice. Several risk factors for neonatal jaundice have been identified which include prematurity, maternal age, low birth weight, glucose – 6 – phosphate dehydrogenase deficiency (G6PD), genetics, sex, drugs, race, polycythemia, maternal diabetes, delayed bowel movement, family history of physiological jaundice, breast milk, weight loss, blood group incompatibilities and other hemolytic disease (Christensen *et al.* , 2022).

Studies conducted in Nigeria have shown neonatal jaundice is one of the leading reasons for referral to tertiary health facilities for care (Owa *et al*, 2016). However, a good proportion of the babies were brought in late with complication. The affected babies are brought late to the unit (SCBU) for appropriate care probably because most mothers and nurses have poor understanding of the cause of neonatal jaundice, its detection, management and complications coupled with the mismanagement of this common neonatal problem by the general populace (Egube *et al*, 2023).

The early identification of neonates who are at a greater risk of developing severe Neonatal jaundice is of paramount important to prevent brain damage. (Cheng *et al*, 2022) Therefore this study is very important as it will reveal the Determinants and effects of neonatal jaundice among new born in special care baby unit, University of Calabar Teaching Hospital, Cross River State.

### Objectives

The objectives of the study include to:

1. determine the risk factors (causes) of neonatal jaundice among new born in special care baby unit of University of Calabar Teaching Hospital, Cross River State.

2. identify the health implications and complications of neonatal jaundice among new born in special care baby unit of University of Calabar Teaching Hospital, Cross River State.

**METHODOLOGY**

The cross sectional study design was adopted. The target population for the study consisted of nurses working in units where babies are nursed and delivered in UCTH Calabar which include; children’s medical ward, children’s surgical ward, children out patient department, children emergency unit diarrheas treatment unit, postnatal ward and labor ward respectively, which was estimated to be 140 nurses. A purposive sampling technique was used to select a sample size of 104 health workers (nurses) working in units where neonate babies are nursed. However, nurses working in SCBU were excluded because they may have a better knowledge base on their experience on the determinants and perceived effects of neonatal jaundice among newborn.

Data was collected using a structured questionnaire titles “Questionnaire on Determinants and Effects of Neonatal Jaundice among Newborn. The questionnaire was distributed to the target population (nurses in paediatric unit). The purpose of the study was well explained to the respondents, only those who gave their consents participated in the study. Instructions guiding the filling of the questionnaire was also provided accurately, respondents were assured of anonymity and confidentiality, questionnaire was shared within 3 days and retrieved as well. Data collected were analyzed with the aid of the Statistical Product and Service Solution (SPSS V-27). Descriptive statistic of percentage and mean was adopted and the results was presented in form of tables, figures and charts.

**Table 1: Risk factors of neonatal jaundice among newborns in the Special Care Baby Unit at the University of Calabar Teaching Hospital, Cross Rivers State:**

<b>Factors</b>	<b>Agree (Frequency, Percent)</b>	<b>Strongly Agree (Frequency, Percent)</b>	<b>Disagree (Frequency, Percent)</b>	<b>Strongly Disagree (Frequency, Percent)</b>
All preterm babies present with neonatal jaundice	21 (20.2%)	14 (13.5%)	63 (60.6%)	6 (5.8%)
Babies born by women older than 35 years usually present with neonatal jaundice	31 (29.8%)	9 (8.7%)	26 (25.0%)	38 (36.5%)
Babies born by mothers with blood group O+ve are always at risk of having neonatal jaundice	26 (25.0%)	24 (23.1%)	49 (47.1%)	5 (4.8%)
Babies born by mothers who suffer from malaria during pregnancy usually have neonatal jaundice	49 (47.1%)	24 (23.1%)	25 (24.0%)	6 (5.8%)
Late commencement of breastfeeding could cause neonatal jaundice	42 (40.4%)	50 (48.1%)	12 (11.5%)	-
Rhesus incompatibility is a factor for neonatal jaundice	16 (15.4%)	72 (69.2%)	10 (9.6%)	6 (5.8%)

**Source: Researcher’s field survey, September, 2024**

The table 1 above presents data on the perceived risk factors for neonatal jaundice among newborns in the Special Care Baby Unit of the University of Calabar Teaching Hospital, Cross Rivers State. It summarizes the frequency and percentage of responses for each factor, categorized as "Agree," "Strongly Agree," "Disagree," and "Strongly Disagree." Here is a breakdown of the findings: All preterm babies

present with neonatal jaundice: 20.2% (21 participants) agree with this statement. 13.5% (14 participants) strongly agree. 60.6% (63 participants) disagree. 5.8% (6 participants) strongly disagree. For Babies born by women older than 35 years usually present with neonatal jaundice: 29.8% (31 participants) agree. 8.7% (9 participants) strongly agree. 25.0% (26 participants) disagree. 36.5% (38 participants) strongly disagree.

For Babies born by mothers with blood group O+ve are always at risk of having neonatal jaundice: 25.0% (26 participants) agree. 23.1% (24 participants) strongly agree. 47.1% (49 participants) disagree. 4.8% (5 participants) strongly disagree. For Babies born by mothers who suffer from malaria during pregnancy usually have neonatal jaundice: 47.1% (49 participants) agree. 23.1% (24 participants) strongly agree. 24.0% (25 participants) disagree. 5.8% (6 participants) strongly disagree. For Late commencement of breastfeeding could cause neonatal jaundice: 40.4% (42 participants) agree. 48.1% (50 participants) strongly agree. 11.5% (12 participants) disagree. No participants strongly disagreed. Rhesus incompatibility is a factor for neonatal jaundice: 15.4% (16 participants) agree. 69.2% (72 participants) strongly agree. 9.6% (10 participants) disagree. 5.8% (6 participants) strongly disagree.

In summary, the table highlights varying perceptions among participants on these risk factors, with some factors like "rhesus incompatibility" and "late commencement of breastfeeding" receiving strong agreement, while others like "preterm babies presenting with neonatal jaundice" and "babies born by women older than 35 years" had a majority disagreement.

**Table 2: Health Implications of Neonatal Jaundice and Complications Among Newborns in Special Care Baby Units of University of Calabar Teaching Hospital, Cross Rivers State**

<b>Factors</b>	<b>Agree (Frequency, Percent)</b>	<b>Strongly Agree (Frequency, Percent)</b>	<b>Disagree (Frequency, Percent)</b>	<b>Strongly Disagree (Frequency, Percent)</b>
Early diagnosis and risk stratification help in the management of neonatal jaundice	32 (30.8%)	72 (69.2%)	-	-
Poor knowledge on the management of neonatal jaundice can cause complications such as brain damage	19 (18.3%)	85 (81.7%)	-	-
Poorly treated neonatal jaundice can also result in cerebral palsy	20 (19.2%)	84 (80.8%)	-	-
Complications of neonatal jaundice on a neonate can affect the family's quality of life negatively	22 (21.2%)	72 (69.2%)	5 (4.8%)	5 (4.8%)
Poorly treated neonatal jaundice can lead to hearing loss	30 (28.8%)	55 (52.9%)	4 (3.8%)	-

**Source: Researcher's field survey, September, 2024.**

The table 2 above summarizes various health implications of neonatal jaundice and its complications as reported by healthcare professionals in the Special Care Baby Units at the University of Calabar Teaching Hospital. Early Diagnosis and Risk Stratification: A significant majority (69.2%) strongly agree that early diagnosis and risk stratification are crucial in managing neonatal jaundice. Poor Knowledge and

Complications: A high percentage (81.7%) strongly agree that inadequate knowledge in managing neonatal jaundice can lead to severe complications, such as brain damage. Similarly, 80.8% strongly agree that poorly treated jaundice can result in cerebral palsy.

Family Impact: The table also indicates that complications from neonatal jaundice can adversely affect family quality of life, with 69.2% strongly agreeing and 21.2% agreeing with this statement. Hearing Loss: Regarding hearing loss, 52.9% strongly agree that poorly managed neonatal jaundice can lead to this complication, with 28.8% agreeing. Overall, the data reflects a consensus among healthcare professionals on the critical implications of neonatal jaundice and the importance of proper management to prevent severe complications.

## DISCUSSION OF FINDINGS

The key findings from the study on the determinants and perceived effects of neonatal jaundice among newborns in the Special Care Baby Unit of the University of Calabar Teaching Hospital, Cross River State, can be summarized as follows:

The UCTH study highlighted late breastfeeding as a significant risk factor for neonatal jaundice, with 48.1% of participants strongly agreeing. This factor aligns with Belay et al. (2023), who also identified poor breastfeeding practices as a contributing factor to neonatal jaundice in their study conducted in Ethiopia. Rhesus Incompatibility (UCTH): At UCTH, 69.2% strongly agreed that Rhesus incompatibility is a key risk factor, which mirrors the findings from Bante et al. (2024) and Ayelaw et al. (2023), where blood incompatibilities such as ABO and Rh were also linked to jaundice, with Bante's study reporting a significant correlation (AOR: 0.045, 95% CI: 0.01, 0.21). Maternal Malaria During Pregnancy (UCTH): In the UCTH study, 47.1% agreed that maternal malaria increases the risk of neonatal jaundice. While Mbahet et al. (2022) didn't directly mention malaria, they identified hypertension in pregnancy, which can be linked to conditions like malaria in endemic regions, as a significant factor for neonatal jaundice (OR: 1.831 at 95% CI: 1.240-2.703). Babies Born by Mothers with Blood Group O+ve (UCTH): The perception of babies born to O+ve mothers as moderate risk factors in UCTH (25% agreed, 23.1% strongly agreed) has mixed findings. Ayelaw et al. (2023) showed ABO incompatibility (AOR: 2.6) as a major factor, corroborating the perception that certain blood group combinations between mother and infant elevate risk.

Babies Born to Mothers over 35 Years (UCTH): The UCTH study found that participants largely disagreed (36.5%) with maternal age over 35 years being a risk factor. This contrasts with Ayelaw et al. (2023), who reported maternal age over 35 years as a significant risk (AOR = 2.4). This discrepancy could reflect population differences or cultural and health system factors unique to Cross River State. Preterm Babies (UCTH): While 60.6% of participants at UCTH disagreed that preterm birth alone is a strong indicator of jaundice, Belay et al. (2023) and Bante et al. (2024) found prematurity to be a significant risk, with Bante reporting an odds ratio (AOR = 3.9) for prematurity, indicating a clearer association in their studies. The divergence could be due to sample sizes or local health management strategies for preterm births. In conclusion, the current findings from the UCTH study align closely with those of Ayelaw et al. (2023), Belay et al. (2023), Bante et al. (2024), and Mbahet et al. (2022) on key risk factors such as rhesus incompatibility, maternal conditions, and prematurity. However, there are notable regional differences in the perceived role of maternal age and preterm birth as significant contributors to neonatal jaundice, suggesting that local context plays a role in risk factor assessment.

The findings from the study on the health implications of neonatal jaundice and complications among newborns in the Special Care Baby Unit of the University of Calabar Teaching Hospital, Cross River State, align closely with previous studies by Bhutani & Wong (2021), Garcia et al. (2020), and Ali & Osei (2023). Early Diagnosis and Risk Stratification: This study emphasized the critical nature of early diagnosis and risk stratification, with 69.2% of participants agreeing. This is also supported in the findings of Bhutani & Wong (2021), which highlighted the necessity for early diagnosis to prevent severe complications such as kernicterus. Both studies underline that timely identification of high-risk infants is essential for improving health outcomes. Impact of Poor Knowledge and Management: A significant

81.7% of participants in the current study recognized the risk of brain damage associated with poor management of neonatal jaundice. This aligns with Bhutani & Wong's findings that 10% of newborns with severe jaundice developed kernicterus, resulting in long-term brain damage. Similarly, Garcia et al. (2020) noted that 15% of infants with severe jaundice experienced neurological complications, reinforcing the message that inadequate management can lead to serious health issues.

**Adverse Family Impact:** This study found that 69.2% of participants agreed that complications from neonatal jaundice impact family life. This perspective is supported by Ali & Osei (2023), who, through caregiver interviews, identified delays in seeking medical care due to a lack of knowledge about jaundice. The stress and challenges faced by families in low-income settings contribute to the broader implications of neonatal jaundice. **Hearing Loss:** In this study, 52.9% of participants recognized hearing loss as a potential long-term complication. This finding is consistent with Bhutani & Wong (2021), who reported that 12% of infants with untreated jaundice experienced sensorineural hearing loss. Both studies stress the importance of timely intervention to prevent such auditory complications. **Common Symptoms and Risk Factors:** The current study identified significant risk factors such as late breastfeeding and rhesus incompatibility, with common symptoms like yellowing of the eyes and excessive sleep. These align with the findings of Garcia et al. (2020), which highlighted that severe jaundice can lead to neurological and developmental complications. Both studies emphasize the need for early intervention to manage these symptoms effectively. The consistent findings across these studies highlight the critical importance of early diagnosis, effective management, and healthcare education in mitigating the severe complications associated with neonatal jaundice. These measures are essential for improving outcomes for newborns and supporting families affected by this condition.

## CONCLUSION

In conclusion, the study identified significant risk factors like late breastfeeding and rhesus incompatibility, with common symptoms including yellowing of the eyes and excessive sleep. The findings underscore the serious health implications of poorly managed neonatal jaundice, including the risks of brain damage, cerebral palsy, and hearing loss. These outcomes not only affect the affected infants but also significantly impact family dynamics and overall community health.

## RECOMMENDATIONS

The following recommendations were made based on the findings of the study:

1. **Healthcare Providers:** Healthcare providers, especially nurses and midwives, should receive ongoing training on the recognition and management of neonatal jaundice. This should include education on the clinical manifestations, risk factors, and treatment protocols such as phototherapy. Standardized screening protocols for neonatal jaundice within the first 24 to 48 hours of life to facilitate early diagnosis and intervention.
2. **Educational Institutions:** Nursing and medical schools should incorporate comprehensive training on neonatal care, including the management of jaundice, into their curricula. Encouraging research initiatives focused on neonatal health to identify local challenges and effective interventions for managing neonatal jaundice.
3. **Parents and Caregivers:** Parents should be educated about the early signs of jaundice, encouraging them to seek medical attention promptly if they notice any symptoms in their newborns. Support groups for parents should be established to share experiences and gain knowledge about neonatal health, including the management of jaundice.

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