IJH INTERNATIONAL JOURNAL OF HEALTH
Volume 02 Number 01 (May 2026)
e-ISSN: 3164-8835; p-ISSN: 3164-8827

Midwifery care for a term neonate with physiological jaundice: A case report

Farra Kharismadiyanti[1], Finta Isti Kundarti[1]

[1]Department of Midwifery, Poltekkes Kemenkes Malang, Kediri, East Java, Indonesia

Corresponding Author: Finta Isti Kundarti, fintaistikundarti@gmail.com

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Abstract:
Physiological jaundice affects most newborns during the first week of life and, although usually benign, requires structured monitoring to detect progression to severe hyperbilirubinemia. This case report aimed to describe and evaluate midwifery care for a 3-day-old term neonate with physiological jaundice. A descriptive single-case study, reported according to the CARE guidelines, was conducted on a female neonate (40 weeks' gestation; birth weight 3,100 g) at a primary health center in Indonesia. Data were obtained through maternal interview, physical examination, visual jaundice assessment using Kramer's zones, and record review, and were analyzed using the SOAP midwifery management framework. On day 3, jaundice was confined to the face and sclera (Kramer zone 1), vital signs were normal, primitive reflexes were strong, and no danger signs were present; the mother reported limited breast milk production. Care included breastfeeding positioning and attachment education, feeding every two hours or on demand, danger-sign education, advice on brief morning sunlight exposure, and three days of home-visit monitoring. The infant remained clinically stable without complications. Midwife-led monitoring, breastfeeding optimization, and maternal education are a feasible, low-cost approach to physiological jaundice in primary care when supported by objective bilirubin measurement and clear referral criteria.

Keywords:
breastfeeding; case report; midwifery care; neonatal jaundice; physiological icterus

Article Info:
Submitted:
14-04-2025
Revised:
17-05-2026
Accepted:
17-05-2026
Published:
17-05-2026

https://doi.org/10.53713/ijh.v2i1.729

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INTRODUCTION

The transition from intrauterine to extrauterine life requires rapid physiological adaptation, and the first week after birth is a period of high vulnerability for newborns. Neonatal jaundice, the yellow discoloration of the skin, sclera, and mucous membranes caused by elevated serum bilirubin, is the most common clinical finding during this period. It is observed in approximately 60% of term and 80% of preterm infants in the first week of life, and it remains one of the leading reasons for neonatal clinic visits and hospital readmission worldwide (Olusanya et al., 2018).

Most cases are physiological. Newborns produce more bilirubin than adults because they have a higher red blood cell mass and a shorter erythrocyte lifespan of about 70–90 days. At the same time, the neonatal liver has limited capacity for uptake and conjugation because uridine

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e-ISSN: 3164-8835; p-ISSN: 3164-8827

diphosphate glucuronosyltransferase (UGT1A1) activity is still immature. In addition, the sterile neonatal gut and the activity of intestinal beta-glucuronidase increase the enterohepatic reabsorption of bilirubin (Hansen et al., 2020). The result is a transient rise in unconjugated bilirubin that typically becomes visible after 24 hours of age, peaks on days 3–5 in term infants and resolves within one to two weeks.

The clinical challenge is that physiological and pathological jaundice can look similar at the bedside. Jaundice that appears within the first 24 hours, rises rapidly, persists beyond two weeks, or is accompanied by poor feeding, lethargy, or signs of hemolysis requires urgent evaluation. Hemolytic disease, ABO or Rh incompatibility, glucose-6-phosphate dehydrogenase deficiency, sepsis, and suboptimal feeding are among the most important risk factors (Kemper et al., 2022; Rahmadani & Sutrisna, 2022). When unconjugated bilirubin crosses the blood–brain barrier, it can cause acute bilirubin encephalopathy and kernicterus, which lead to permanent neurological disability or death. Globally, an estimated 481,000 term and late-preterm infants developed extreme hyperbilirubinemia in 2010, and the burden of death and disability fell mainly on low- and middle-income countries (Bhutani et al., 2013).

Feeding plays a central role in this process. Frequent and effective breastfeeding supplies calories and fluid, stimulates bowel movements, and promotes the passage of bilirubin-rich meconium, thereby limiting enterohepatic circulation. In contrast, inadequate milk intake in the first days of life, often described as suboptimal intake or "breastfeeding" jaundice, is a recognized and preventable contributor to exaggerated hyperbilirubinemia (Flaherman & Maisels, 2017). Indonesian studies have similarly reported that early initiation of breastfeeding is associated with a lower incidence of neonatal jaundice (Nirwana et al., 2022; Umar et al., 2021).

However, breastfeeding frequency alone does not necessarily indicate adequate milk intake. Assessment should also consider positioning and attachment, audible swallowing, feeding effectiveness, urine and stool output, and changes in body weight. These indicators are particularly important during the first days after birth, when maternal milk production is still being established, and bilirubin concentrations may continue to rise. Early identification of inadequate intake enables midwives to provide targeted lactation support, arrange closer follow-up, and identify newborns who require further clinical assessment (Flaherman & Maisels, 2017; Kemper et al., 2022).

International guidelines now emphasize systematic risk assessment, objective bilirubin measurement using transcutaneous (TcB) or total serum bilirubin (TSB), interpretation against hour-specific thresholds, and timely follow-up after discharge (Kemper et al., 2022). Visual estimation of jaundice, including the cephalocaudal zones described by Kramer (1969), is widely used in primary care but is known to be imprecise (Keren et al., 2009). In many Indonesian communities, mothers are also advised to expose jaundiced infants to morning sunlight, a practice reported in several local case studies (Handayani & Susianty, 2024; Mawaddah et al., 2023), although high-quality evidence for unfiltered sunlight remains limited (Horn et al., 2021).

The implementation of these recommendations may be challenging in primary care settings, where access to bilirubin measurement devices is limited and newborn monitoring relies heavily on clinical observation and home visits. Under these circumstances, midwives must balance the practical use of visual assessment with awareness of its diagnostic limitations, while ensuring that families understand the importance of adequate feeding, the progression of jaundice, and referral

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when warning signs are present. The coexistence of evidence-based recommendations and customary home practices, including sunlight exposure, further highlights the need for clear counseling that distinguishes supportive newborn care from interventions with established therapeutic effectiveness (Keren et al., 2009; Kemper et al., 2022; Horn et al., 2021).

Midwives are often the first and sometimes the only health professionals to assess newborns after early discharge. They identify jaundice, support breastfeeding, educate families about danger signs, and decide when referral is needed. Detailed reports of how this care is delivered and documented in routine practice are useful for teaching and for quality improvement. However, published case reports from Indonesian primary care seldom follow international reporting standards or compare care against current guideline recommendations. This case report therefore aimed to describe the midwifery care provided to a 3-day-old term neonate with physiological jaundice, to evaluate the infant's clinical course during follow-up, and to compare the care delivered with current evidence-based recommendations.

METHODS

This study used a descriptive single-case study design with a midwifery care management approach. The report was prepared in accordance with the CARE (Case Report) guidelines to ensure transparent and complete reporting (Riley et al., 2017). Care was documented using the SOAP format (subjective data, objective data, assessment, and plan), the standard documentation framework in Indonesian midwifery and nursing practice that supports structured clinical reasoning in case-based studies (Afandi et al., 2024).

The study was conducted at a primary health center and in the family's home in Indonesia in February 2026. The participant was a full-term female neonate, identified by the initials "By. K" to protect confidentiality. She was selected purposively because she presented with visible jaundice during a routine neonatal visit on the third day of life. Subjective data were obtained through structured interviews with the mother, covering pregnancy and birth history, feeding patterns, elimination, and her concerns. Objective data were obtained through a head-to-toe physical examination, measurement of vital signs and anthropometry, assessment of primitive reflexes, and review of the birth record and the Maternal and Child Health (MCH) handbook. Jaundice was assessed visually, and its extent was classified according to Kramer's cephalocaudal zones, from zone 1 (head and neck) to zone 5 (palms and soles) (Kramer, 1969). Serum and transcutaneous bilirubin measurements were not available at the time of the visit.

Midwifery care was planned in accordance with the assessment and current recommendations for breastfed infants (Flaherman & Maisels, 2017; Kemper et al., 2022). It comprised: (1) explaining the examination findings and the nature of physiological jaundice to the mother; (2) teaching correct breastfeeding positioning and attachment and advising feeding every two hours or on demand; (3) educating the mother on neonatal danger signs and when to seek care; (4) advising brief morning sunlight exposure as practiced locally, with eye protection and regular repositioning; and (5) documenting care in the MCH handbook. Health education was delivered individually and face-to-face, an approach previously shown to improve patient outcomes in nursing case studies (Azkiya et al., 2024).

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The infant was monitored through structured home visits over three consecutive days. At each visit, the midwife reassessed the general condition, vital signs, extent of jaundice, feeding frequency and effectiveness, elimination, and the presence of danger signs. The primary outcome was the clinical course of jaundice. Secondary outcomes were feeding adequacy, the occurrence of complications, and the need for referral. Data were analyzed descriptively. Findings from each SOAP cycle were compared with theoretical and guideline criteria for physiological and pathological jaundice to establish the midwifery diagnosis, assess the appropriateness of the care plan, and evaluate outcomes. Results are presented narratively and summarized in tables. The study adhered to the principles of the Declaration of Helsinki. Permission was obtained from the health care facility, and informed consent was obtained from the mother before assessment and care. The infant's identity was anonymized, and all data were kept confidential and used only for the purposes of this report.

RESULTS

The infant was a female neonate born by spontaneous vaginal delivery on 1 February 2026 at 40 weeks' gestation, with a birth weight of 3,100 g. She cried immediately after birth, had pink-red skin, was active, and had no visible congenital anomalies. Breastfeeding was initiated immediately after birth. She received vitamin K1 (0.1 mL intramuscularly) and hepatitis B (HB0) immunization. Mother and infant were discharged home after 12 hours of observation.

During the routine neonatal visit on day 3, mild yellow discoloration was observed on the infant's face. The mother reported that her breast milk production was still limited. The infant was alert, active, and in good general condition, with vital signs and anthropometric measurements within normal limits. Jaundice was confined to the face and sclera, corresponding to Kramer zone 1. Rooting, sucking, and swallowing reflexes were strong, and no neurological abnormality was found. The umbilical cord was still moist. The main clinical findings are summarized in Table 1.

Based on these findings, the midwifery diagnosis was a 3-day-old term neonate, appropriate for gestational age, with physiological jaundice. The jaundice appeared after 24 hours of age, was limited to Kramer zone 1, and occurred in a well infant without risk factors for hemolysis. The identified potential problem was suboptimal breast milk intake, which could worsen hyperbilirubinemia, and the immediate need was breastfeeding support.

The mother was informed of the findings and reassured that physiological jaundice is common, usually appears around the third day of life, and generally resolves within 10 days to 2 weeks. She was taught correct breastfeeding positioning and attachment and was advised to feed every 2 hours or whenever the infant showed hunger cues. She received education on danger signs, including jaundice spreading to the trunk or limbs, fever or low body temperature, refusal to feed, rapid breathing, excessive sleepiness, and bleeding or foul-smelling discharge from the umbilical cord. In line with local practice, she was advised to expose the infant to morning sunlight between 07:00 and 08:00 for 5–10 minutes, with the eyes protected and the infant's position changed periodically. All care was recorded in the MCH handbook. The care plan and its rationale are presented in Table 2.

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Table 1. Clinical findings of the neonate at the day-3 assessment

Parameter	Finding	Interpretation
Gestational age and birth weight	40 weeks; 3,100 g	Term, appropriate for gestational age
Birth history	Spontaneous vaginal delivery; cried immediately; active; no congenital anomalies; early initiation of breastfeeding	Uncomplicated birth
Age at assessment	Day 3 (discharged at 12 hours of age)	Jaundice onset after 24 hours of age
General condition	Good; alert (compos mentis); active movements	Normal
Heart rate	128 beats/min	Normal (120–160 beats/min)
Respiratory rate	48 breaths/min	Normal (40–60 breaths/min)
Body temperature	36.7 °C	Normal (36.5–37.5 °C)
Anthropometry	Birth weight 3,100 g; length 50 cm; head circumference 34 cm; chest circumference 33 cm	Within normal limits
Skin, sclera, and conjunctiva	Yellow discoloration of the face; icteric sclera; pink conjunctiva	Jaundice limited to Kramer zone 1 (head and neck)
Primitive reflexes	Rooting, sucking, and swallowing strong; blinking, tonic neck, Babinski, and stepping reflexes present	Normal neurological status
Head-to-toe examination	No caput succedaneum, nasal flaring, cleft lip or palate, chest retraction, or abdominal distension; normal female genitalia; patent anus	No abnormality detected
Umbilical cord	Still moist	Normal for age
Feeding	Breastfed; mother reported limited breast milk production	Risk of suboptimal milk intake

Note: Reference ranges are those commonly used for term neonates. Kramer zones range from zone 1 (head and neck) to zone 5 (palms and soles).

Table 2. Midwifery care plan, implementation, and rationale

Problem or need	Midwifery intervention	Rationale and evidence
Maternal concern and need for information	Explained the examination findings; explained that physiological jaundice usually appears around day 3 and resolves within 10 days to 2 weeks	Clear individual education reduces anxiety and supports engagement in care (Azkiya et al., 2024)
Limited breast milk production; risk of suboptimal intake	Taught correct breastfeeding positioning and attachment; advised feeding every 2 hours or on demand	Frequent effective feeding increases stooling and limits enterohepatic circulation of bilirubin (Flaherman & Maisels, 2017; Hansen et al., 2020)
Risk of progression to significant hyperbilirubinemia	Educated the mother on danger signs; conducted home visits over three consecutive days to reassess jaundice extent, feeding, vital signs, and danger signs	Bilirubin peaks on days 3–5; follow-up after early discharge is recommended (Kemper et al., 2022)
Local practice of sunlight exposure	Advised morning sunlight (07:00–08:00) for 5–10 minutes with eye protection and periodic repositioning	Common local practice; evidence for unfiltered sunlight is insufficient (Horn et al., 2021)
Continuity of care	Documented assessment and care in the MCH handbook using the SOAP format	Structured documentation supports clinical reasoning and continuity across visits (Afandi et al., 2024)

Note: MCH = Maternal and Child Health; SOAP = subjective, objective, assessment, plan.

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During three days of home-visit follow-up, the infant remained in good general condition with stable vital signs, continued to breastfeed, and developed no danger signs. No complications occurred, no referral was required during the follow-up period, and the infant's condition improved with the care provided.

DISCUSSION

This case report describes midwifery care for a term, well neonate who developed visible jaundice on the third day of life after early discharge. The clinical picture was consistent with physiological jaundice, and the infant remained stable during follow-up with care focused on breastfeeding support, maternal education, and home-based monitoring. The case also highlights two gaps between routine practice and current evidence: the absence of objective bilirubin measurement and the continued use of sunlight exposure as a home remedy.

Several features supported the diagnosis of physiological jaundice. The jaundice became visible after 24 hours of age, was limited to the face and sclera, and occurred in a term infant with normal birth weight, normal vital signs, strong primitive reflexes, and no clinical signs of hemolysis or infection. This timing aligns with the expected course of neonatal bilirubin metabolism, in which unconjugated bilirubin levels rise due to high red blood cell turnover, limited hepatic conjugation, and enhanced enterohepatic circulation (Hansen et al., 2020). Similar presentations and outcomes have been described in Indonesian midwifery case studies of physiological jaundice (Handayani & Susianty, 2024; Mawaddah et al., 2023). Nevertheless, physiological jaundice is a diagnosis that is confirmed over time. Peak bilirubin in term infants usually occurs between days 3 and 5, so an infant who appears mildly jaundiced on day 3 can still progress. For this reason, the follow-up visits were as important as the initial assessment.

The most important modifiable factor in this case was feeding. The mother reported limited milk production on day 3, which is common before secretory activation is fully established. Inadequate intake reduces stool frequency and delays the passage of meconium, which contains a large amount of bilirubin. When meconium remains in the gut, bilirubin is deconjugated and reabsorbed into the circulation, increasing the bilirubin load on an immature liver (Hansen et al., 2020). The Academy of Breastfeeding Medicine therefore recommends early and frequent breastfeeding, at least 8–12 times in 24 hours, together with skilled lactation support, as the first-line preventive strategy for jaundice in breastfed infants (Flaherman & Maisels, 2017). The advice given in this case, to feed every two hours or on demand with attention to positioning and attachment, is consistent with this recommendation. Colostrum also acts as a natural laxative and supports early gut colonization, which further reduces bilirubin reabsorption. These mechanisms help explain why early initiation of breastfeeding has been associated with a lower risk of neonatal jaundice in Indonesian hospital and community settings (Nirwana et al., 2022; Umar et al., 2021).

Although the clinical presentation in this case was consistent with physiological jaundice, the reported limitation in breast milk production warrants consideration of the possible contribution of suboptimal milk intake. Physiological jaundice and suboptimal-intake hyperbilirubinemia may overlap in the first days of life, as inadequate feeding can increase enterohepatic circulation of bilirubin and contribute to rising unconjugated bilirubin levels. This distinction is clinically

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important because the presence of an apparently physiological pattern does not exclude feeding-related factors that may aggravate hyperbilirubinemia. Therefore, midwives should assess both the timing and progression of jaundice and the adequacy of breastfeeding before determining the appropriate follow-up and management plan (Hansen et al., 2020; Flaherman & Maisels, 2017).

Feeding adequacy, however, should be assessed objectively rather than inferred from maternal report alone. Useful indicators include the number of feeds, the number of wet diapers and stools, the transition from meconium to yellow stools, and weight change from birth. Weight loss greater than about 10% by day 3 or 4 suggests insufficient intake and should prompt more intensive lactation support and closer monitoring of bilirubin (Flaherman & Maisels, 2017). Including these indicators in the SOAP record would make the evaluation of breastfeeding effectiveness more precise and would strengthen future case reports.

A key limitation of this case was the reliance on visual assessment. Kramer's zones provide a simple, low-cost way to describe the cephalocaudal spread of jaundice (Kramer, 1969), but visual estimation correlates poorly with measured bilirubin levels and can either underestimate or overestimate the true value (Keren et al., 2009). The 2022 American Academy of Pediatrics guideline recommends that every jaundiced infant have a TcB or TSB measurement interpreted against hour-specific thresholds that account for gestational age and neurotoxicity risk factors, a concept derived from the hour-specific bilirubin nomogram (Bhutani et al., 1999; Kemper et al., 2022). Visual assessment remains useful for triage, but it cannot replace measurement. Providing transcutaneous bilirubinometers in primary health centers and training midwives to use them would enable earlier recognition of infants approaching treatment thresholds and reduce both unnecessary referrals and missed cases.

The use of morning sunlight in this case reflects a widespread Indonesian practice, and local studies have reported reductions in visible jaundice after sunlight exposure (Handayani & Susianty, 2024; Mawaddah et al., 2023; Puspitosari et al., 2006). However, international evidence does not support the use of unfiltered sunlight as a treatment for neonatal jaundice. A Cochrane review found insufficient high-quality evidence to recommend sunlight for preventing or treating hyperbilirubinemia (Horn et al., 2021). Direct sunlight delivers ultraviolet radiation and heat, which may cause sunburn, hyperthermia, and dehydration, while also providing an uncontrolled, unmeasured light dose. Filtered sunlight, in which ultraviolet and infrared radiation are removed by special window films, has been shown to be safe and effective in a randomized trial, but only under close clinical supervision and with bilirubin monitoring (Slusher et al., 2015, 2017). In this case, exposure was brief and supervised, so the risk was small, but improvement cannot be attributed to sunlight. Midwives should therefore present sunlight exposure, if at all, as a comfort measure and never as a substitute for bilirubin measurement, breastfeeding support, or phototherapy when it is indicated.

The early discharge of mother and infant at 12 hours of age underlines the importance of post-discharge follow-up. Because bilirubin peaks after most mothers and newborns have gone home, guidelines recommend that the timing of follow-up be based on the infant's age at discharge and risk profile (Kemper et al., 2022). In Indonesia, scheduled neonatal visits and home visits by midwives provide a practical mechanism for this follow-up. In this case, the routine day-3 visit detected jaundice, and three consecutive home visits allowed the midwife to confirm a stable

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course, reinforce breastfeeding, and check the mother's understanding of danger signs. Clear communication and structured handover between facility staff and community midwives are essential for this continuity, as shown in case studies of structured pre- and post-conference practice (Afandi et al., 2023).

Early discharge also creates a clinical responsibility to ensure that newborn assessment is not limited to the condition observed at the time of discharge. An infant discharged at 12 hours of age may develop more apparent jaundice after returning home, when bilirubin concentrations are still increasing. Consequently, discharge planning should include an assessment of jaundice risk, breastfeeding effectiveness, parental understanding of warning signs, and a clearly documented follow-up schedule. Where objective bilirubin measurement is unavailable, visual assessment should be combined with careful clinical evaluation and a low threshold for referral when jaundice progresses, feeding becomes inadequate, or signs of illness appear. This approach is particularly relevant to primary care settings, where community midwives play an important role in post-discharge newborn surveillance (Kemper et al., 2022).

Maternal education was a central component of care. Mothers are often the first to notice changes in skin color, feeding, or alertness, and their ability to recognize danger signs determines how quickly a deteriorating infant reaches care. Structured, individual education has been shown to reduce anxiety and improve patient preparedness in other clinical contexts (Azkiya et al., 2024). At the community level, trained health cadres can extend this support between professional visits, as demonstrated in community empowerment programs for maternal and child nutrition (Ardiana et al., 2020). Digital tools offer a further opportunity. Mobile health applications and telemonitoring have been reported to support adherence and follow-up in tuberculosis care (Afandi et al., 2026), and similar approaches, such as smartphone reminders, photo-based follow-up, or short messaging with the midwife, could support home monitoring of neonatal jaundice in settings where repeated home visits are difficult.

These findings have implications for midwifery practice and education. Physiological jaundice is common and usually benign, but the rare progression to severe hyperbilirubinemia carries devastating consequences, particularly in low-resource settings (Bhutani et al., 2013; Olusanya et al., 2018). Midwives therefore need a systematic approach that combines risk assessment, objective measurement, breastfeeding support, family education, and clear referral criteria. Documenting care using the SOAP framework and reporting cases in accordance with international standards can strengthen both clinical reasoning and the evidence base for midwifery practice.

This report has several limitations. It describes a single case, so the findings cannot be generalized. Bilirubin levels were not measured, and the evaluation relied on visual assessment. Feeding adequacy was not quantified with weight change or elimination patterns, and the follow-up period was limited to three days, so the exact time of resolution was not documented. Future case series should include TcB or TSB measurements, standardized feeding indicators, and follow-up until jaundice resolves.

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CONCLUSION

This case report shows that a 3-day-old term neonate with physiological jaundice confined to Kramer zone 1 remained clinically stable and free of complications under midwife-led care that combined breastfeeding optimization, maternal education on danger signs, and three days of structured home monitoring. This approach is simple, low-cost, and suitable for primary care. To align routine practice with current evidence, midwives should confirm jaundice using transcutaneous or serum bilirubin measurements, objectively monitor feeding adequacy, use clear referral thresholds, and avoid relying on sunlight exposure as a treatment.

ACKNOWLEDGEMENT

The author would like to express sincere gratitude to all parties who provided support in implementing this study, especially to the health care facility that granted permission and the opportunity to conduct this case study. The author also extends appreciation to By's mother and family. K for their willingness to participate in this study, as well as to the supervising lecturer for the guidance, direction, and valuable input throughout the preparation of this article. The support and cooperation from various parties greatly contributed to the successful completion of this case study and the provision of care.

CONFLICT OF INTEREST

There is no conflict of interest in this research.

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