



The Relationship between Maternal Knowledge and Administering Hepatitis B Immunization in the First 24 Hours to Newborns

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Abstract

Background : Hepatitis B immunization in newborns is an important strategy to prevent hepatitis B virus transmission from the beginning of life . The birth dose is recommended as soon as possible after birth , particularly within the first 24 hours . Maternal knowledge regarding the benefits and timing of immunization May contribute to timely immunization practices. Objective : To determine the relationship between maternal knowledge and Hepatitis B immunization within the first 24 hours among newborns. Methods : This study used an observational analytics design with a cross-sectional approach . The study was conducted from May to July 2026 at a healthcare facilities . A total of 109 mothers with newborns who met the inclusion criteria were recruited using consecutive sampling. The independent variable was maternal knowledge , while the dependent variable was timely Hepatitis B immunization within the first 24 hours . Data were collected using knowledge questionnaire and immunization observation / documentation records . Data were analyzed using the Chi- square test with a significance level of $\alpha=0.05$. Results : Sixty-two mothers (56.9%) had good knowledge , 31 mothers (28.4%) had moderate knowledge , and 16 mothers (14.7%) had poor knowledge . Hepatitis B immunization within the first 24 hours was administered to 78 newborns (71.6%), while 31 newborns (28.4%) were not received immunization within this time limit. The proportion of timely immunization was higher among mothers with good knowledge (83.9%) than among those with moderate (64.5%) and poor knowledge (43.8%). The Chi- square test demonstrated a significant relationship between maternal knowledge and Hepatitis B immunization within the first 24 hours ($p=0.006$). Conclusion : Maternal knowledge was significantly associated with Hepatitis B immunization within the first 24 hours among newborns .

Keywords : Maternal Knowledge , Hepatitis B Immunization , Newborn , Birth-Dose Immunization

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1. Introduction

Hepatitis B remains an important public health problem because infection with hepatitis B virus (HBV) can develop into chronic liver disease, cirrhosis, and hepatocellular carcinoma (Shepard et al., 2006; World Health Organization [WHO], 2024). Transmission can occur through exposure to infected blood and body fluids, including mother-to-child transmission during the perinatal period (WHO, 2017; Schillie et al., 2018).

Preventing hepatitis B transmission in infants needs to begin as early as possible after birth. One of the most important preventive measures is administration of the hepatitis B vaccine birth dose. WHO recommends that all infants receive the first dose of hepatitis B vaccine as soon as possible after birth, preferably within 24 hours, because timely vaccination is effective in reducing the risk of perinatal and early-life HBV infection (WHO, 2017; Ministry of Health of the Republic of Indonesia, 2022).

The success of an immunization program is influenced not only by vaccine availability and access to health services but also by parental acceptance and vaccine confidence (MacDonald, 2015; Doherty et al., 2016). As one of the primary decision-makers in infant care, mothers need to understand the benefits of immunization, the recommended schedule, vaccine safety, and the consequences of delayed immunization. Adequate knowledge may support parents in understanding health information and making appropriate decisions regarding their children's immunization (Centers for Disease Control and Prevention [CDC], 2021; American Academy of Pediatrics, 2024).

Maternal knowledge may influence the acceptance and utilization of hepatitis B immunization. Mothers who understand the benefits of hepatitis B vaccination and the importance of administering the birth dose are expected to be more receptive to information provided by health workers and more likely to ensure that their infants receive immunization according to the recommended schedule (MacDonald, 2015; WHO, 2017).

In neonatal care, some infants may not receive hepatitis B immunization within the first 24 hours after birth. This situation may be associated with several factors, including maternal knowledge and acceptance, the infant's clinical condition, medical considerations, vaccine availability, and health-service factors (Schillie et al., 2018; Ministry of Health of the Republic of Indonesia, 2022).

Based on this description, this study was conducted to analyze the relationship between maternal knowledge and the administration of hepatitis B immunization within the first 24 hours among newborns.





2. Research Methods

This study used an analytical observational design with a cross-sectional approach to assess the relationship between maternal knowledge and Hepatitis B immunization administration within the first 24 hours of birth. The study was conducted at a healthcare facility providing maternity and neonatal services from May to July 2026.

The population consisted of mothers with newborns who received delivery and neonatal care at the study site, with a total of 109 mother–newborn pairs meeting the study criteria selected using consecutive sampling. Data were analyzed using univariate analysis to describe respondent characteristics, knowledge levels, and immunization status, while bivariate analysis was performed using the Chi-square test with a significance level of $\alpha = 0.05$.

3. Results And Discussion

a. Result

Table 1. Distribution of Maternal Characteristics

Characteristics	n	%
Age		
<20 years	7	6.4
20–29 years	58	53.2
30–39 years	39	35.8
≥40 years	5	4.6
Education		
Basic education	17	15.6
Secondary education	63	57.8
Higher education	29	26.6
Parity		
Primipara	51	46.8
Multipara	58	53.2
Total	109	100

Most mothers were in the 20–29 age group (58 women) (53.2%). Based on education, the majority of respondents had a secondary education (63 women) (57.8%). Based on parity, 58 mothers (53.2%) were multiparous.

Table 2. Distribution of Mothers' Knowledge Levels regarding Hepatitis B Immunization

Level of knowledge	n	%
Good	62	56.9
Enough	31	28.4
Not enough	16	14.7
Total	109	100

Most respondents (62 respondents, 56.9%) had good knowledge of Hepatitis B immunization. Thirty-one (28.4%) had sufficient knowledge, and 16 (14.7%) had insufficient knowledge.





Table 3. Administration of Hepatitis B Immunization in the First 24 Hours

Grant status	n	%
Given ≤ 24 hours	78	71.6
Not given ≤ 24 hours	31	28.4
Total	109	100

A total of 78 babies (71.6%) received Hepatitis B immunization within the first 24 hours, while 31 babies (28.4%) had not received immunization within that time limit.

Table 4. Relationship between Mother's Knowledge and Administration of Hepatitis B Immunization in the First 24 Hours

Knowledge	Given ≤ 24 hours n (%)	Not given ≤ 24 hours n (%)	Total	p- value
Good	52 (83.9)	10 (16.1)	62	0.006
Enough	20 (64.5)	11 (35.5)	31	
Not enough	7 (43.8)	9 (56.2)	16	
Total	79 (72.5)	30 (27.5)	109	

The analysis showed that the proportion of infants receiving Hepatitis B immunization within the first 24 hours was higher in the group of mothers with good knowledge, namely 52 of 62 mothers (83.9%). In the group with sufficient knowledge, 20 of 31 infants (64.5%) received immunization within the first 24 hours, while in the group with poor knowledge, 7 of 16 infants (43.8%) received immunization within the first 24 hours. Square test shows a p value of 0.006 ($p < 0.05$) so there is a significant relationship between the level of maternal knowledge and the administration of Hepatitis B immunization in the first 24 hours.

b. Discussion

The results of the study showed that most mothers had good knowledge about Knowledge regarding hepatitis B immunization may include an understanding of the benefits of immunization, the timing of administration, and the importance of protecting infants from the beginning of life. Health knowledge is one component that can support the development of healthy behaviors. Mothers who receive adequate information may have a better foundation for understanding recommendations from healthcare providers and making informed decisions regarding their baby's health care (Centers for Disease Control and Prevention [CDC], 2021; American Academy of Pediatrics, 2024). These findings are consistent with the concept that adequate knowledge and access to appropriate information can support vaccine acceptance and reduce vaccine hesitancy (MacDonald, 2015; Doherty et al., 2016). However, knowledge is not the sole factor determining maternal action, as immunization decisions can also be influenced by access to services, family support, previous experiences, the infant's condition, communication with health workers, and vaccine availability (MacDonald, 2015; WHO, 2017).

Most infants in this study received hepatitis B immunization within the first 24 hours. Administration of the hepatitis B birth dose is an important component of strategies to prevent HBV infection in infants, particularly transmission occurring around the time of





birth (WHO, 2017; Schillie et al., 2018). Timely administration of immunization requires coordination between mothers, families, healthcare workers, and the healthcare system. Information regarding the recommended timing of immunization should be communicated to mothers during pregnancy so that they understand that the birth dose is an essential component of newborn care (Ministry of Health of the Republic of Indonesia, 2022; WHO, 2017). For infants who have not received immunization within the first 24 hours, the reasons for the delay should be assessed. Possible factors include the infant's clinical condition, parental decision-making, vaccine availability, referral processes, and operational factors within health services (Schillie et al., 2018; Ministry of Health of the Republic of Indonesia, 2022).

The study results showed a relationship between maternal knowledge and hepatitis B immunization within the first 24 hours. Mothers with good knowledge had a higher proportion of timely immunization than those with adequate and poor knowledge. These findings suggest that maternal understanding may be associated with vaccine acceptance and adherence to the recommended immunization schedule. Knowledge of the benefits of vaccination and the importance of the birth dose may help mothers understand the reasons healthcare workers recommend immunization immediately after birth (WHO, 2017; MacDonald, 2015). However, associations identified in a cross-sectional study should not be interpreted as demonstrating a direct cause-and-effect relationship.

Maternal knowledge may interact with other factors, such as education, previous childbearing experience, family support, access to health facilities, communication with healthcare workers, and the infant's clinical condition. Vaccine acceptance and uptake are influenced by multiple determinants rather than knowledge alone (MacDonald, 2015; Doherty et al., 2016). Therefore, efforts to increase coverage of hepatitis B immunization at birth should not be limited to providing information at the time of delivery. Prenatal education, consistent communication between midwives and mothers, and strengthening the neonatal immunization service system may form part of a more comprehensive approach to improving timely birth-dose vaccination (WHO, 2017; Ministry of Health of the Republic of Indonesia, 2022).

This study has several limitations. The cross-sectional design only describes the relationship between maternal knowledge and hepatitis B immunization status during the observation period and therefore cannot establish a causal relationship. Maternal knowledge was assessed using a questionnaire, so responses may have been influenced by respondents' interpretation and understanding of the questions. In addition, the study was conducted at a single healthcare facility, which may limit the generalizability of the findings to populations with different characteristics. Other factors that may influence timely hepatitis B immunization, including family support, access to healthcare services, vaccine availability, communication with healthcare workers, and the infant's clinical condition, were not comprehensively analyzed.

4. Conclusion

Most mothers had a good level of knowledge regarding Hepatitis B immunization, with 62 mothers (56.9%) categorized as having good knowledge, while 78 infants (71.6%)





received Hepatitis B immunization within the first 24 hours after birth. The analysis showed a significant relationship between maternal knowledge and the provision of Hepatitis B immunization within the first 24 hours, with $p = 0.006$. Health workers are expected to strengthen education regarding Hepatitis B immunization from pregnancy and reinforce the information immediately after delivery, while healthcare facilities should improve the recording, monitoring, and communication of immunization administration to facilitate early identification of delays. Mothers and families are encouraged to actively obtain information from health workers regarding the benefits, safety, and appropriate timing of Hepatitis B immunization for newborns. Future researchers are recommended to examine additional factors, including family support, access to healthcare services, the role of health workers, vaccine availability, maternal attitudes, and infant clinical factors, to provide a more comprehensive understanding of factors associated with timely Hepatitis B immunization.

Reference

- Aji, SP, Rosita, R., Saide, R., Sabriana, R., Lubis, H., Fatimah, S., & Alfah, S. (2024). Midwifery Care in the Pollution Period With Level II Perineal Rupture Pain At The Palangga Health Center. *International Journal of Health Sciences*, 2(2), 628–642. <https://doi.org/10.59585/ijhs.v2i2.355>
- Abbas AK, Lichtman AH, Pillai S. *Cellular and molecular immunology*. 10th ed. Philadelphia : Elsevier ; 2022.
- American Academy of Pediatrics . *Red Book : 2024–2027 report of the Committee on Infectious Diseases*. 33rd ed. Itasca : American Academy of Pediatrics ; 2024.
- Beauchamp TL, Childress JF. *Principles of biomedical ethics*. 8th ed. New York : Oxford University Press ; 2019.
- Burnett RJ, François G, Kew MC, Leroux-Roels G, Meheus A, Hoosen AA, et al. Hepatitis B vaccination in pregnancy : an underutilized tool to prevent mother-to-child transmission . *Lancet Infect Dis*. 2017;17(12):e316-e323.
- Centers for Disease Control and Prevention . *Epidemiology and prevention of vaccine-preventable diseases*. 14th ed. Washington, DC: Public Health Foundation ; 2021.
- Doherty M, Buchy P, Standaert B, Giaquinto C, Prue C. Vaccine impact : benefits for human health . *Vaccines*. 2016;34(52):6707-6714.
- Hall E, Wodi AP, Hamborsky J, Schillie S, editors . *Epidemiology and prevention of vaccine-preventable diseases*. 14th ed. Washington, DC: CDC; 2021.
- Ministry of Health of the Republic of Indonesia. *Guidelines for routine immunization services*. Jakarta: Ministry of Health of the Republic of Indonesia; 2022.
- Ministry of Health of the Republic of Indonesia. *Indonesian health profile 2023*. Jakarta: Ministry of Health of the Republic of Indonesia; 2024.
- Liang X, Bi S, Yang W, Wang L, Cui G, Cui F, et al. Epidemiological serosurvey of hepatitis B in China—declining HBV prevalence due to hepatitis B vaccination . *Vaccines*. 2009;27(47):6550-6557.
- Mulia, M., Rosmiati, R., Rahmat, RA, Pannyiwi, R., & Wijayanti, LA (2026). Bullying And Its Relationship To Anxiety , Depression , And Self-Esteem . *International Journal of Health Sciences*, 4(1), 61–67. <https://doi.org/10.59585/ijhs.v4i1.1097>
- MacDonald NE. Vaccine hesitancy : definition , scope and determinants . *Vaccines*. 2015;33(34):4161-4164.
- Pannyiwi, R., Rahmat, RA, & Mainassy, MC (2026). Drug-Aware Village: Community Empowerment in Realizing Safe Household Drug Management: Drug-Aware Village : Community Empowerment to





- Ensure a Safe Household Medication Management . Sahabat Sosial: Journal of Community Service, 4(4), 1846–1852. <https://doi.org/10.59585/sosisabdimas.v4i4.1652>
- Pannyiwi, R., Rahmat, RA, Cakrawati R, CR, Dasaryandi , KR, & Nasution, N. (2026). Empowering Diabetes Mellitus Patients in Preventing Diabetic Ulcers and the Risk of Recurrent Infection: Empowerment of Patients with Diabetes Mellitus in the Prevention of Diabetic Ulcers and the Risk of Recurrent Infection . Barongko : Journal of Health Sciences, 5(1), 985–991. <https://doi.org/10.59585/bajik.v5i1.1586>
- Plotkin SA, Orenstein WA, Offit PA, Edwards KM, editors . Plotkin's vaccines . 8th ed. Philadelphia : Elsevier ; 2024.
- Pannyiwi, R. (2026). The Free Nutritional Meal Program (MBG) as a Government Intervention to Improve Children's Health and Learning Achievements . Social Friends: Journal of Community Service, 4(4), 1586–1599. Retrieved from <https://jurnal.agdosi.com/index.php/jpemas/article/view/1361>
- Saide, R., Idris, I., Nawangwulan, K., Yusufik , Y., Djunaedi , D., & Jamin, NS (2024). Counseling for Public Elementary Schools in the Context of Preventing Diarrhea in Children for a Healthy and Happy Life in Maros Regency. Sahabat Sosial: Journal of Community Service, 2(2), 188–202. <https://doi.org/10.59585/sosisabdimas.v2i2.309>
- Schillie S, Vellozzi C, Reingold A, Harris A, Haber P, Ward JW, et al. Prevention of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices . MMWR Recomm Rep . 2018;67(1):1-31.
- Shepard CW, Simard EP, Finelli L, Fiore AE, Bell BP. Hepatitis B virus infection : epidemiology and vaccination . Epidemiol Rev . 2006;28:112-125.
- World Health Organization . Hepatitis B vaccines : WHO position paper . Wkly Epidemiol Rec . 2017;92(27):369-392.
- World Health Organization . Global hepatitis report 2024: action for access , equity and prevention . Geneva : World Health Organization ; 2024.
- World Health Organization , United Nations Children's Fund Estimates of national immunization coverage : 2023 revision . Geneva : WHO; 2024.
- Wahyuni, T., Achmad, VS, Pannyiwi, R., & Rahmat, RA (2025). The Relationship Between Nurse's Knowledge about Ventilators and Compliance in Preventing Ventilator - Associated Pneumonia (VAP) in the ICU. International Journal of Health Sciences , 3(4), 704–710. <https://doi.org/10.59585/ijhs.v3i4.892>

