



The Relationship Between Mothers' Anxiety Levels and Hb-0 Vaccination among Infants in Kota Datar Village

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<p>Track Record Article</p> <p>Revised: 6 January 2026 Accepted: 26 February 2026 Published: 31 March 2026</p> <p>How to cite : Safitri, Y., Kaban, N. B., Sitorus, N. Y., & Putri, P. S. (2026). The Relationship Between Mothers' Anxiety Levels and Hb-0 Vaccination among Infants in Kota Datar Village. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 8(1), 404-411.</p>	<p style="text-align: center;">Abstract</p> <p><i>Timely administration of the hepatitis B vaccine at birth (HB-0) is crucial to prevent mother-to-child transmission of the hepatitis B virus. However, HB-0 vaccination coverage, both globally and locally, remains below the desired level. Maternal concerns have been suggested as a potential barrier to newborn vaccination. This study aimed to evaluate the relationship between maternal anxiety levels and the use of HB-0 vaccination in infants in Kota Datar Village, located in Hamparan Perak District, Deli Serdang. In January and February 2024, a cross-sectional survey was conducted involving all mothers with infants aged 0–7 days (n = 35). Maternal anxiety was measured using the 20-item Zung Anxiety Scale. HB-0 vaccine acceptance was documented based on maternal statements and local government records. Chi-square analysis was used to test the relationship, with a significance level of $\alpha = 0.05$. The group of 35 participants consisted mostly of people aged 20–35 years, and all had completed high school education. HB-0 was administered to 37.1% of infants (13 of 35). Conversely, 62.9% (22 of 35) did not receive HB-0 within the specified birth period. Maternal anxiety was a common problem, affecting 25 of 35 women. Mothers with severe anxiety were significantly less likely to administer HB-0 than those with mild anxiety ($\chi^2, p = 0.002$). Survey responses, which included quantitative data, showed that safety concerns, fear of fever after vaccination, and misinformation were common reasons for concern. In this group, a significant association was found between maternal anxiety and reduced HB-0 acceptance. To improve the timely immunization of newborns against hepatitis B, it is recommended to use interventions that include prenatal counseling, focused information about risks, and increased involvement of frontline health workers. Future research should investigate the extent to which interventions to reduce anxiety affect vaccine acceptance.</i></p> <p>Keywords: <i>Hepatitis B Birth Dose, HB-0 Immunization, Maternal Anxiety, Vaccine Uptake, Newborn Immunization.</i></p>
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INTRODUCTION

Hb-0 immunization is a vaccine given to infants to protect them from hepatitis infection, the liver (Sidabutar et al., 2021), and can cause liver cancer if it persists into adulthood (Kartika et al., 2022; Safitri et al., 2023). The currently available hepatitis B vaccine is safe and highly effective in the prophylaxis of HBV infection, yet the implementation of universal vaccination and timely birth dose is suboptimal (Zhao et al., 2020). According to the latest WHO report (2024), global coverage of Hepatitis B immunization at birth (dose zero, Hb-0) is only around 45% for newborns (World Health Organization, 2025). According to the 2023 Indonesian Health Survey Report, Hepatitis B vaccination coverage in newborns within the first 24 hours after birth reached 77.4% nationally, with North Sumatra Province recording a

higher coverage of 81.2%, indicating regional variations and relatively strong performance in early immunization efforts (Badan Kebijakan Pembangunan Kesehatan, 2023).

Immunization against Hepatitis B in babies, with or without the administration of hepatitis B immune globulin (HBIG), has been effective in preventing vertical transmission from mother to child (Wibowo et al., 2025). The execution of efficient hepatitis B vaccination initiatives can be seen in a notable decrease in HBV carrier rates and hepatitis B-associated morbidity and mortality due to the hepatitis B virus (HBV), which infects the liver and can lead to chronic liver conditions, including cirrhosis and hepatocellular carcinoma (Pattyn et al., 2021).

The enduring immunological response after HBV immunization during infancy has been examined in many nations. High levels of antibodies against HBV were identified in several trials (Cheang et al., 2013; Ma et al., 2020; Phattraprayoon et al., 2022; Poovorawan et al., 2013; Roznovsky et al., 2010). Hence, booster immunization was deemed unnecessary. Nonetheless, other studies with long-term assessments have shown a reduction in antibody levels in persons vaccinated against HBV in infancy, prompting recommendations for revaccination (Klinger et al., 2018; Phattraprayoon et al., 2022; Pileggi et al., 2017; Van Der Sande et al., 2006). According to Mutyoba (Mutyoba et al., 2021), evaluating the perspectives of pregnant women is crucial in developing culturally relevant hepatitis B prevention guidelines and services for newborns in this population, including the prevention of hepatitis B transmission from mother to child.

Dessy's findings at the Bandar Baru Health Center, Sibolangit District, show that the HB 0 vaccination rate among infants is still low, at 39.0%. This is related to predisposing factors, including knowledge and attitudes, facilitating factors such as place of birth, and reinforcing factors that strengthen family support (Hutasoit, 2025). Nadjib's research findings reveal that there is still significant resistance among mothers of toddlers, both those born in health facilities and those born outside of them, due to negative perceptions about the safety of immunizations, such as fear that their children will develop a fever, or resistance based on the belief that the vaccines contain harmful ingredients. Therefore, the role of health workers is crucial in providing support and reassurance to mothers (Sukrisno & Nadjib, 2022).

Data from the North Tapanuli District Health Office in 2023 shows that the coverage of HB-0 (Hepatitis B-0) immunization for infants aged 0-7 days in North Tapanuli District is very good, at 78.47%. Interviews conducted by researchers with 10 mothers in November 2023 revealed that most mothers, namely 80%, indicated that they did not fully understand HB-0 immunization and were afraid of the effects of immunization on their babies. This was a factor

that caused these mothers to feel anxious about giving HB-0 immunization to their babies. Therefore, this study aims to determine the relationship between maternal anxiety levels and the administration of HB-0 immunization to infants in Kota Datar Village.

METHODS

This is a quantitative study with a cross-sectional design to understand the correlation (relationship) between risk factors and effects. This study was carried out from January to February 2024, in Kota Datar, a village in Hamparan Perak District, Deli Serdang. The population includes all mothers in Kota Datar Village, Hamparan Perak District, Deli Serdang who had babies aged 0-7 days, totaling 35 mothers. Sampling in this study used total sampling, involving 35 people with the following inclusion criteria: mothers who were willing to participate in this study, mothers who had babies aged 0-7 days, and mothers who could read and write.

Since this study involves humans as its research participants, ethical principles and considerations were used in that the respondents were given the rights to decide whether or not they were willing to be subjects, without penalty, and without causing suffering to the respondents. The researchers also provided complete and detailed explanations and information, as well as taking responsibility if anything happened to the respondents. Respondents must also be treated well before, during, and after the study. Respondents were not be discriminated against if they refused to participate. The data collection tool in this study was a questionnaire. To measure anxiety levels, the researcher used the Zung Anxiety Scale, which consisted of 20 statements. To examine the relationship between the independent and dependent variables, the Chi-square statistical test was used with a significance level ($\alpha < 0.05$).

RESULTS

According to Table 1, all 35 respondents (100%) were included in the analysis. The majority were between 20 and 35 years of age (22 respondents, 62.86%), while a smaller proportion were under 20 years old (6 respondents, 17.14%). In terms of education, most respondents had completed high school (19 respondents, 54.29%), whereas only a few had a basic education (elementary or junior high school; 3 respondents, 8.57%). Regarding occupation, the majority were housewives (22 respondents, 62.86%), and a small number were civil servants or private employees (2 respondents, 5.71%).

Table 1. Frequency Distribution of Respondents Based on Characteristics of Kota Datar Village, Hamparan Perak District, Deli Serdang Regency

Respondent Characteristics	f	%
Age		
<20 years old	6	17.14
20 - 35 years old	22	62.86
> 35 years old	7	20
Total	35	100
Education		
Elementary School and Junior High School	3	8,57
Senior High School	19	54.29
Bachelor's degree or Diploma III	13	37.14
Total	35	100
Work		
Houswife	22	63.86
Farmer	4	11.43
Enterprenur	7	20.00
Civil Servant or Private Employee	2	5.71
Total	35	100

The analysis presented in Table 2 shows that most mothers with severe anxiety did not administer HB-0 immunization to their infants (20 out of 25 respondents, 57.2%) . In contrast, the majority of mothers with mild anxiety did provide the HB-0 immunization (8 out of 10 respondents, 22.9%) . The Chi-square test yielded a p-value of 0.002 ($p < 0.05$), indicating a statistically significant relationship between maternal anxiety levels and HB-0 immunization practices in Kota Datar Village, Hamparan Perak District, Deli Serdang Regency.

Table 2 Frequency Distribution of the Relationship between Maternal Anxiety Levels and HB-0 Immunization Practices in Infants in Kota Datar Village, Hamparan Perak District, Deli Serdang Regency

Maternal Anxiety	Immunization Administration				Total	P value
	Given		Not Given			
	n	%	n	%	N	
Light	8	22.9	2	5.7	10	28.6
Heavy	5	14.2	20	57.2	25	71.4
Total	13	37.1	22	62.9	35	100

DISCUSSION

The results of this study provide a valuable reference for future research on maternal anxiety and newborn immunization, both in terms of findings and supporting literature. The chi-square test produced a p-value of 0.002 ($p < 0.05$), confirming a significant relationship between maternal anxiety levels and HB-0 immunization practices in Kota Datar Village, Hamparan Perak District, Deli Serdang Regency. These results indicate that mothers experiencing high levels of anxiety are more likely to refuse Hb-0 immunization for their infants.

The findings of this study align with several previous studies. Rosiska (2022) reported a significant relationship ($p = 0.014$) between maternal anxiety and the completion of basic immunization during the COVID-19 pandemic. Similarly, Amalia et al., (2021) found a significant correlation between parental anxiety ($\rho = 0.005$) and the timeliness of basic immunization. Zakiyah et al., (2024) highlighted the impact of post-immunization side effects on maternal anxiety ($p = 0.000$), underscoring concerns about adverse reactions. Novika et al., (2024) further demonstrated that maternal anxiety related to DPT immunization was influenced by knowledge, attitudes, and family support ($p < 0.05$), pointing to the role of psychosocial factors. Consistent with these studies, the present research in Kota Datar Village identified a significant association between maternal anxiety and HB-0 immunization ($p = 0.002$), reinforcing the conclusion that anxiety is a critical determinant of immunization compliance across different vaccines and contexts.

A more in-depth analysis is needed to understand why anxiety may pose a stronger barrier to HB-0 vaccination compared to other routine immunizations. The HB-0 vaccine must be administered within the first 24 hours after birth, a critical period when infants are in their most vulnerable physical condition. Maternal anxiety during this phase is distinct from that experienced in later immunization stages, as it coincides with the postpartum recovery, a period marked by hormonal fluctuations, physical exhaustion, and emotional adjustment.

For mothers, administering an injection to a newborn often creates an internal conflict between the instinct to protect a “vulnerable” baby and the medical obligation to ensure long-term protection. This tension can trigger heightened fears of pain or side effects, which may feel more intense than later immunization stages when the child is several months old. As a result, HB-0 requires a higher level of psychological readiness within a very short timeframe. Unmanaged anxiety in the first hours after birth can significantly hinder immunization uptake, making HB-0 a distinct public health challenge compared to other childhood vaccination programs.

The findings of this study, together with related research findings, indicate that anxiety is closely linked to toddler immunization practices, often stemming from limited knowledge and fears that vaccines may harm children. Such fears are reinforced by experiences of post-vaccination fever and exposure to negative information from the community or social media. Consequently, the role of health workers, local health departments, and the Ministry of Health is crucial in strengthening public education and promoting awareness of the importance of immunization, especially the Hb-0 vaccine for newborns, to enhance immunity and prevent viral infections in infants.

The findings of this study carry important implications for health workers in Kota Datar Village, particularly regarding the need to strengthen communication and education strategies to improve HB-0 immunization coverage, which remains low at 37.1%. Interventions should not only address clinical aspects but also focus on reducing psychological barriers during the antenatal period. However, there are several limitations in this study that need to be considered. First, the small sample size (n=35) restricts the generalizability of the results and reduces statistical power. Second, the cross-sectional design prevents causal inference, making it unclear whether maternal anxiety leads to vaccine refusal or whether refusal itself heightens anxiety. Third, the study did not account for key confounding factors such as maternal HBV status, knowledge of hepatitis B, place of delivery, socioeconomic status, and the influence of husbands or extended family, which may play a dominant role in decision-making. Finally, self-reported measures of anxiety and behavior may be subject to social conformity bias, with respondents potentially providing answers aligned with social expectations rather than their actual experiences.

CONCLUSIONS

In a cross-sectional study involving 35 mothers of newborns in Kota Datar Village, Hampan Perak District, Deli Serdang, researchers found a significant relationship between high levels of maternal anxiety and a decrease in the acceptance of hepatitis B vaccine doses at birth (HB-0). Mothers experiencing severe anxiety were less likely to immunize their infants compared to those with moderate anxiety. These findings highlight how psychological barriers, such as safety concerns, limited knowledge, and worries about recent adverse events, can hinder timely newborn vaccination. To address these challenges, programmatic interventions should include clear and culturally sensitive communication from health workers, prenatal counseling to alleviate safety concerns, and community-level initiatives to counter misinformation. Such measures are expected to improve the timely administration of HB-0. Further studies, using multilevel and longitudinal approaches, are needed to evaluate specific counseling strategies and disentangle anxiety from related factors, including maternal knowledge, place of birth, and social support.

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