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The Implementation Analysis Related To The Prevention Of Hepatitis B Disease Among Health Workers In Lebong Regency In 2025

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ABSTRACT

The Data from WHO in 2019 estimated that 296 million people live with chronic hepatitis B infection, with 1.5 million new infections occurring each year, leading to approximately 820,000 deaths. The transmission of this virus primarily occurs through contact with infected blood or bodily fluids, placing health workers at high risk of contracting Hepatitis B. Hepatitis B vaccination coverage among health workers remains low, below 60%. This study aims to analyze the factors influencing the transmission of hepatitis B infection among health workers in Lebong Regency. The method used in this study is quantitative research with a cross-sectional approach, and its statistical analysis employs Chi-Square and logistic regression analysis. Among all observed variables that showed a statistical relationship (P<0.05) are immunization status, use of Personal Protective Equipment (PPE), implementation of standard operating procedures (SOP), and behavior (p <0.05). The results of the bivariate analysis using the Chi-square statistical test (continuity correction) yielded asymptotic significance (p) values of 0.001, 0.002, 0.013, and 0.046. The second analysis results indicated that the variables of immunization status (p value=0.002), use of PPE (p value=0.006), implementation of SOP (p value=0.059), and behavior (p value=0.017) were significant, with immunization status having the smallest p value (Sig) of 0.002. From the analysis, an Odds Ratio (OR) of 5.606 was obtained, indicating that immunization status has a 5.606 times greater chance of hepatitis B occurrence among health workers. Based on the results of this study, program holders should evaluate the planning and implementation of vaccination programs, ensuring that health workers in healthcare facilities receive Hepatitis B immunization.

INTRODUCTION

According to the World Health Organization (WHO), approximately 325 million people suffer from Hepatitis B or C, with hepatitis-related deaths in the Asia-Pacific region exceeding those from HIV/AIDS. Indonesia has a prevalence of 7.1% for Hepatitis B and 1% for Hepatitis C, placing it among the ten countries with the highest burden. Without effective interventions, hepatitis cases are expected to rise, placing additional strain on the healthcare system and the economy (Susanto, 2024).

To address this, WHO and the European Union have collaborated to strengthen Indonesia's health system, including efforts to combat hepatitis. This initiative focuses on improving access to healthcare services and ensuring system sustainability. Together with the Ministry of Health of the Republic of Indonesia (Kemenkes RI) and the Clinton Health Access Initiative (CHAI), WHO has integrated the Hepatitis and Gastrointestinal Infectious Disease Information System (SIHEPI) into electronic health data at primary health centers (puskesmas) and hospitals in Jakarta. The aim is to enhance health information systems and strengthen hepatitis control efforts. The National Hepatitis Elimination Profile provides information on epidemiological burden, program status, and the operational environment in Indonesia. WHO also collaborates with local partners to develop policies and mobilize resources to achieve hepatitis elimination by 2030 (Tri Rini Puji Lestari, 2024).

WHO reports that 38 countries account for nearly 80% of global hepatitis infections and deaths, with Indonesia included among the ten highest-burden countries. In Indonesia, Hepatitis B prevalence is 7.1%, and Hepatitis C is 1%. Without effective action, cases are projected to increase, further burdening the healthcare system and economy. Accordingly, the World Health Assembly (WHA) adopted a resolution to eliminate hepatitis by 2030, emphasizing the importance of global collaboration (Direktorat Jenderal Pelayanan Kesehatan, 2022).

Hepatitis, caused by viruses A, B, C, D, and E, leads to liver inflammation. Hepatitis B and C can result in cirrhosis and fatal liver cancer. In developing countries, perinatal transmission—from mother to child during pregnancy, delivery, or breastfeeding—is a primary route of Hepatitis B infection. Vertical transmission contributes significantly to chronic Hepatitis B in adulthood, which can

progress to liver cancer or cirrhosis. Horizontal transmission within households also increases acute Hepatitis B infections (Tri Rini Puji Lestari, 2024).

Healthcare workers are at high risk of Hepatitis B exposure. The Ministry of Health reports a Hepatitis B prevalence of 4.7% among healthcare workers, with 36.7% having protective anti-HBs antibodies. To protect healthcare workers and accelerate Hepatitis B elimination by 2030, the government provides free Hepatitis B vaccination to this group (Kemenkes RI, 2023).

The Sustainable Development Goals (SDGs), specifically Goal 3, Target 3.3, aim to end the epidemics of AIDS, tuberculosis, malaria, neglected tropical diseases, and combat hepatitis and other communicable diseases by 2030. In Southeast Asia, Indonesia has the second-highest Hepatitis B endemicity after Myanmar (Kemenkes RI, 2020). Hepatitis B is a viral infection that can cause serious complications such as cirrhosis, liver cancer, and liver failure. Transmission occurs mainly through contact with infected blood or body fluids, making healthcare workers particularly vulnerable, especially during medical procedures or exposure to infectious materials without proper personal protective equipment (PPE) and infection control practices.

Hospitals and health facilities play a critical role in providing care while minimizing infection risks. However, studies show that compliance with PPE use and Standard Operating Procedures (SOPs) in some facilities remains suboptimal, coupled with insufficient vaccination coverage and lack of structured training, increasing the risk of Hepatitis B transmission to both healthcare workers and patients. Infection prevention and control (IPC) protocols and education are therefore essential to reduce exposure risks (Kemenkes RI, 2023).

Lebong Regency, located in Bengkulu Province, has a population of 114,146 in 2023 (Dinas Catatan Sipil Kab. Lebong, 2024). Health services include general hospitals, blood transfusion units, inpatient and non-inpatient puskesmas, sub-health centers (pustu), village health posts (poskesdes), maternity posts (polindes), integrated health posts (posyandu), and community-based health posts (posbindu) (Dinkes Kab. Lebong, 2024).

In 2023, the number of healthcare workers in Lebong Regency was insufficient, with only 23 doctors (10 general practitioners, 11 specialists, 3 dentists), a ratio of 24.5 general practitioners and 9.6 specialists per 100,000 population. There were 250 nurses and 229 midwives. Hepatitis B vaccination coverage among healthcare workers in Bengkulu reached 78%, while Lebong Regency only achieved 54% in 2024. National targets aim for 100% vaccination of healthcare workers by 2030.

Based on this background, this study aims to analyze the implementation of Hepatitis B prevention among healthcare workers in health facilities in Lebong Regency, Bengkulu Province, in 2025. The research seeks to identify the risk of Hepatitis B infection, contributing factors, and preventive measures implemented.

RESEARCH METHODS

This study employed a quantitative cross-sectional design, where data were collected at a single point in time to analyze factors influencing healthcare workers' behavior, adherence to personal protective equipment (PPE) use, and compliance with standard operating procedures (SOPs) in relation to Hepatitis B immunization status in Lebong Regency, Bengkulu Province.

The research was conducted in health facilities across the regency from January to June 2025, targeting healthcare workers at high risk of Hepatitis B exposure. The study population included all healthcare workers in these facilities, while the sample consisted of 788 active healthcare workers who directly interact with patients. Sampling was performed using Slovin's formula and random sampling techniques.

Data were collected through structured questionnaires, interviews, and secondary data from medical records. Data preparation included reviewing literature, conducting a proposal seminar, and planning the field survey. Data processing involved editing, coding, entry into SPSS, cleaning, and transformation to ensure accuracy and suitability for statistical analysis. Data analysis was performed using univariate, bivariate, and multivariate statistical methods to identify significant relationships between variables and determine factors affecting Hepatitis B immunization compliance among healthcare workers.

RESULTS

Univariate Analysis

Univariate analysis aims to determine the description of the research variables. The results of the univariate analysis are shown in the table below:

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Tabel 1 Results of Univariate Analysis

Variabel	Kategori	n	%
Hepatitis B	Reaktif	50	56,2
	Tidak Reaktif	39	43,8
Status Imunisasi	Tidak Imunisasi	61	68,5
	Imunisasi	28	31,5
Penggunaan APD	Tidak Menggunakan	45	50,6
	Menggunakan	44	49,4
Penerapan SOP	Tidak Diterapkan	53	59,6
	Diterapkan	36	40,4
Perilaku	Tidak Mendukung	57	64,0
	Mendukung	32	36,0

Source: Processed Data, 2025

From Table 1, it can be seen that most respondents (56.2%) were reactive for hepatitis B, the majority of respondents (68.5%) were not immunized, some of the respondents (50.6%) did not use PPE, the majority of respondents (59.6%) did not implement SOPs, and the majority of respondents (64.0%) had unsupportive behavior towards health workers in Lebong District in 2025.

Bivariate Analysis

Bivariate analysis was conducted to determine the factors associated with hepatitis B cases among health workers in Lebong District in 2025, as shown in the table below:

Table 2 Results of Bivariate Analysis

Variabel	Kategori	Hepatitis B				P value
		Reaktif		Tidak Reaktif		
		N	%	n	%	
Status Imunisasi	Tidak Imunisasi	42	68,9	19	31,1	0,001
	Imunisasi	8	28,6	20	71,4	
Penggunaan APD	Tidak Menggunakan	33	73,3	12	26,7	0,002
	Menggunakan	17	38,6	27	61,4	
Penerapan SOP	Tidak Diterapkan	36	67,9	17	32,1	0,013
	Diterapkan	14	38,9	22	61,1	
Perilaku	Tidak Mendukung	37	64,9	20	35,1	0,046
	Mendukung	13	40,6	19	59,4	

Source: Processed Data, 2025

Table 2 shows that the factors significantly associated with hepatitis B cases among health workers in Lebong District in 2025 are immunization status, use of PPE, implementation of SOPs, and behavior ($p < 0.05$). The results of bivariate analysis using the Chi-square statistical test (continuity correction) obtained asymp.sig values of (p) = 0.001, 0.002, 0.013, and 0.046. Since the p-value is <0.05, there is a significant relationship between immunization status, PPE use, SOP implementation, and behavior with the incidence of hepatitis B among healthcare workers in Lebong District in 2025.

Multivariate Analysis

The variable requirements for logistic regression analysis are p value < 0.25. Thus, the variables included in the multivariate analysis are immunization status (p value=0.001), use of PPE (p value=0.002), implementation of SOPs (p value=0.013), and behavior (p value=0.046). The results of the first step of the logistic regression analysis show that the variables of immunization status, PPE use, SOP implementation, and behavior have a p-value < 0.05, meaning that these variables are significant. Therefore, a second analysis was conducted by analyzing the variables of immunization status, PPE use, SOP implementation, and behavior. The results of the second analysis showed that the variables of immunization status (p value=0.002), PPE use (p value=0.006), SOP implementation (p value=0.059), and behavior (p value=0.017) were significant.

Table 3 Results Multivariate Analysis

Sub Variabel	B	S.E	Wald	df	P Value	OR
Status Imunisasi	1,724	0,569	9,175	1	0,002	5,606
Penggunaan APD	1,542	0,558	7,633	1	0,006	4,673
Penerapan SOP	1,005	0,531	3,576	1	0,059	2,371
Perilaku	1,371	0,573	5,370	1	0,017	3,938

Source: Processed Data, 2025

Based on the results of the above study, it is known that the variable most closely related to the incidence of hepatitis B among health workers in Lebong District in 2025 is the immunization status variable with the smallest p (Sig) value of 0.002. From the analysis results, an Odd Ratio (OR) value of 5.606 was obtained, meaning that immunization status has a 5.606 times greater chance of hepatitis B occurrence among healthcare workers in Lebong District in 2025.

DISCUSSION

Relationship between Immunization Status and Hepatitis B Incidence among Healthcare Workers in Lebong Regency, 2025

The analysis revealed a significant relationship between Hepatitis B immunization status and infection among healthcare workers in Lebong Regency. Among those not immunized, 68.5% (n=61) experienced Hepatitis B, compared to 31.5% (n=28) among immunized workers. Chi-square analysis showed a p-value of 0.001, and the odds ratio (OR) was 5.526, indicating that unvaccinated healthcare workers were over five times more likely to contract Hepatitis B.

These findings highlight immunization as a critical protective factor against Hepatitis B, aligning with previous studies demonstrating lower infection rates among vaccinated healthcare workers (Burnett et al., 2021; Awoke et al., 2020; Bastiangga et al., 2019). Despite its proven effectiveness, Hepatitis B vaccination coverage for healthcare workers in Indonesia remains insufficient. Strengthening national policies to include adult Hepatitis B immunization, particularly for healthcare professionals, is strongly recommended (WHO, 2022).

Relationship between Behavior and Hepatitis B Incidence among Healthcare Workers in Lebong Regency, 2025

The analysis showed a significant association between high-risk behavior and Hepatitis B infection among healthcare workers in Lebong Regency. Among workers with non-supportive or risky behaviors, 64% (n=57) contracted Hepatitis B, compared to 36% (n=32) among those with safe behaviors. Chi-square analysis yielded a p-value of 0.046, and the odds ratio (OR) was 2.704, indicating that risky behaviors increased the likelihood of infection by 2.7 times.

High-risk behaviors include unsafe injection practices, unprotected sexual activity, use of non-sterile tattooing or piercing tools, and sharing personal items, which facilitate horizontal and vertical transmission of HBV. Vertical transmission occurs from mother to child, while horizontal transmission involves exposure to infected blood or bodily fluids (Bustami & Anita, 2019; Rumini et al., 2018; Naully & Nursidika, 2019). Preventive measures, especially vaccination and adherence to hygienic practices, are critical to reducing Hepatitis B risk (Hidayah, 2018; Sari et al., 2018).

Relationship between PPE Usage and Hepatitis B Incidence among Healthcare Workers in Lebong Regency, 2025

The analysis revealed a significant association between personal protective equipment (PPE) usage and Hepatitis B infection among healthcare workers. Among those who did not use PPE, 50.6% (n=45) contracted Hepatitis B, compared to 49.4% (n=44) among PPE users. Chi-square analysis showed p=0.002, with an odds ratio (OR) of 4.368, indicating that not using PPE increased the risk of Hepatitis B infection over four times.

Consistent PPE use significantly reduces the risk of occupational Hepatitis B infection. These findings highlight the importance of intensive training and strict monitoring of PPE usage as a key component of infection prevention strategies in healthcare facilities (Patel et al., 2021; Suksatan et al., 2021).

Relationship between SOP Implementation and Hepatitis B Incidence among Healthcare Workers in Lebong Regency, 2025

The analysis showed a significant association between the implementation of Standard Operating Procedures (SOPs) and Hepatitis B infection among healthcare workers. Among those not following SOPs, 59.6% (n=53) contracted Hepatitis B, compared to 40.4% (n=36) among those who adhered to SOPs. Chi-square analysis yielded p=0.013, with an odds ratio (OR) of 3.328, indicating that non-adherence to SOPs increased the risk of Hepatitis B infection more than threefold.

SOPs provide structured guidelines to ensure tasks are performed consistently and effectively. Proper adherence to SOPs is crucial in reducing occupational risk of Hepatitis B among healthcare workers (Tjipto Atmoko, 2021).

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the results of this study, the conclusions are as follows:

1. The relationship between immunization status and the incidence of Hepatitis B among healthcare workers in health facilities in Lebong Regency in 2025 was identified.
2. The relationship between behavior and the incidence of Hepatitis B among healthcare workers in health facilities in Lebong Regency in 2025 was identified.
3. The compliance with the use of Personal Protective Equipment (PPE) and its effect on the incidence of Hepatitis B among healthcare workers in health facilities in Lebong Regency in 2025 was determined.
4. The compliance with the implementation of Standard Operating Procedures (SOPs) and its effect on the incidence of Hepatitis B among healthcare workers in health facilities in Lebong Regency in 2025 was determined.
5. The most influential variable affecting the incidence of Hepatitis B infection among healthcare workers in health facilities in Lebong Regency in 2025 was identified.

Recommendations

Based on the conclusions of the research results, the author suggests:

1. For the Health Deparment
   Health institutions, particularly program managers, are advised to evaluate and improve immunization programs by incorporating evidence-based data on Hepatitis B vaccination for healthcare workers, including post-primary vaccination and potential causes of inadequate anti-HB formation, to strengthen prevention and protection against Hepatitis B infection.
2. For Healthcare Workers
   Healthcare workers, especially those in health facilities, are expected to receive Hepatitis B vaccination, consistently use Personal Protective Equipment (PPE), comply with Standard Operating Procedures (SOPs), and maintain proper behavior to prevent infectious diseases, particularly Hepatitis B.
3. For the Community
   Healthcare personnel should provide education and information to the public on the importance of Hepatitis B vaccination as a protective measure against horizontal transmission, enabling the community to maintain and safeguard their health.

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