

Hepatitis B vaccine knowledge, perception, and motivation among children and adults in the rural region at Semarang, Indonesia



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ABSTRACT

Background: Hepatitis B is a global health problem with high prevalence, morbidity, and mortality. Knowledge, perception, and motivation for hepatitis B vaccination play significant roles in infection numbers. Thus, this study aimed to investigate the relationship between sociodemographic factors, knowledge, perception, and motivation for hepatitis B vaccination in the rural region of Semarang, Indonesia.

Methods: This cross-sectional study was held in September-October 2019 in the rural region of Semarang, Indonesia. In total, 508 subjects aged 10-40 years participated. The data collected from the questionnaire contains demographic data, knowledge, perception, and motivation for the hepatitis B vaccine. Data analysis using bivariate Chi-Square test.

Results: A total of 508 people met the criteria, 437 respondents (86%) can describe the hepatitis B disease, and 502 respondents (98.8%) agreed with the hepatitis B vaccine. Age significantly affects knowledge and perception of the hepatitis B vaccine ($p=0.004$; $p=0.030$). Sex and education significantly relate to knowledge of hepatitis B disease ($p=0.022$; $p=0.025$). The most motivation is getting free of charge hepatitis B vaccination ($n=223$, 43.9%) and participation in scientific development ($n=184$, 36.2%). One hundred eighty-two people (35.8%), males and 326 females (64.2%) were motivated to get hepatitis vaccination. Age and sex significantly related to the respondent's motivation for the hepatitis B vaccine ($p<0.001$; $p=0.028$).

Conclusion: Knowledge and motivation for hepatitis B vaccination are influenced by age and sex. Older age and females significantly correlate with the reason to have hepatitis B vaccination.

Keywords: Hepatitis B, Knowledge, Perception, Motivation.

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INTRODUCTION

The infection caused by the Hepatitis B virus (HBV) is a significant problem for the health of people all over the world because of its high prevalence, morbidity, and mortality rates. The Hepatitis B virus is a viral infection that targets the liver and may result in life-threatening complications such as cirrhosis and liver cancer.¹ Vaccination against hepatitis B prevents disease with the hepatitis B virus. In Indonesia, infants are vaccinated against hepatitis B at zero days, two months, three months, four months, and five years of age, with booster shots administered every five years. According to a systematic review and a recent meta-analysis evaluating chronic HBV infection globally, approximately 248 million persons were hepatitis B surface

antigen (HBsAg) positive in 2010.^{2,3}

More than 780,000 individuals die annually from hepatitis B disease, including hepatitis B-related cirrhosis and hepatocellular cancer.^{4,5} South Sudan has the highest rate of chronic HBV infection in Africa at 22%. In the case of viral Hepatitis, fewer patients are registered or contact health facilities than the actual number of sufferers. This phenomenon is known as the iceberg effect. Hepatitis B is a chronic disease that looks healthy when a person is infected. They do not exhibit the typical symptoms and signs, but the transmission continues.⁶ Hepatitis B is common in Indonesia and affects infants to the elderly.⁷ However, many individuals are unaware that if the liver is infected with the very infectious hepatitis B virus, it can lead to inflammation, dysfunctional

liver tissue, liver cancer, and death.^{1,8}

In Indonesia's number of patients diagnosed with Hepatitis in healthcare institutions in 2018 is 39%, according to Basic Health Research (Riset Kesehatan Dasar/Riskesdas) data. According to the statistics, Papua had the most significant incidence in Indonesia, followed by Central Sulawesi, West Sulawesi, and East Nusa Tenggara. The most considerable frequency of Hepatitis was seen in the age groups 45-54 (46%) and < 1-year-old (45%). Additionally, the sort of labor influences the prevalence of Hepatitis. Hepatitis is prevalent most among fishers in Indonesia.⁹

HBV infection can be transmitted both vertically and horizontally. The term "vertical transmission" refers to the transfer from the mother to the

infant during the mother's delivery. Horizontal transmission occurs through open wounds with blood contact, blood transfusion, sexual transmission, illegal injectable medicines, and non-sterile equipment.¹⁰ The hepatitis B vaccine can eliminate HBV transmission lines and prevent HBV infection. In Indonesia, infants are vaccinated against Hepatitis B at 0 days, two months, three months, four months, and five years, with booster shots administered every five years.¹¹ According to the ministry of health Indonesia, high-risk groups, such as population groups that engage in risky sexual practices, injecting drug users, health workers, and people with a family history of Hepatitis B, need vaccination.¹²

The vaccination Hepatitis B coverage in Indonesia is still low compared to developed countries. Based on WHO immunization coverage for hepatitis B in 2021, Indonesia was 77%, the United States of America was 91.9%, and the United Kingdom was 92.6%.¹³ The prevalence of HBV infection may be reduced with a thorough understanding of the virus's transmission routes and proper immunization.¹⁴ Vaccination is the most successful and efficient method for preventing HBV infection in a community. However, poverty, illiteracy, and lack of public awareness, awareness, and knowledge about HBV's willingness to screen, vaccinate and treat the disease are still relatively low in resource-limited countries.¹

In previous research on the knowledge, perception, and clinical practice of HBV in France, 9,014 individuals between 18 and 69 were questioned. It was discovered that HBV knowledge was much lower than HIV/AIDS knowledge, and only 27.4% of the individuals were tested for HBV.¹ Other investigations also documented insufficient HBV knowledge and vaccination rates. According to research undertaken among the Turkish population in the Netherlands, awareness about HBV remains relatively low. On the other hand, studies performed among healthcare professionals in Sudan and Morocco found that the majority had a good understanding of blood as an infectious vector but inadequate vaccination coverage.

There is no study on the public knowledge, perception, and motivation for the Hepatitis attention B vaccine in Semarang, Indonesia. Knowledge gaps should receive particular interventions to prevent the spread of HBV infection and promote HBV immunization to the public. This study aims to evaluate urban Semarang residents' knowledge, attitudes, and motives toward Hepatitis B vaccination.

METHODS

A descriptive observational study using the cross-sectional method was conducted from September to October 2019 in Semarang, Central Java, Indonesia. The inclusion criteria for this study were healthy individuals, as evidenced by medical history and physical examination, aged 10-40 years, willing to become respondents after being given a detailed explanation of the study and signing the consent form. The exclusion criteria were respondents who did not fill out the questionnaire completely. Respondents fill out a validated questionnaire containing sociodemography (age, sex, education), motivation, perception, and knowledge of the hepatitis B vaccine.

The type of validation test to evaluate the survey questionnaire about motivation, perception, and knowledge of the hepatitis B vaccine in this study is face validation, by examining the questions in the questionnaire linguistically and analytically to find out what is supposed to be measured based on respondent's understanding of the questions in the questionnaire.

The researcher is requested to subjectively judge the operation of a construct used in the questionnaire and conducted with selected respondents to know how easily they understand the items/questions in the questionnaire, including its feasibility, style formatting, readability, clarity in language, etc. to confirm that the prepared questionnaire format and the presentation of items in it are relevant to be considered as measuring instrument and the things framed are reasonable, clear and unambiguous to understand and respond.

Face validation was determined using a dichotomous scale using Yes

and No options to indicate favorable or unfavorable items. Good items are objectively structured and positively classified under the thematic category. The face validation of the questionnaire instrument was determined using Cohen's Kappa Index on collected data. The Kappa index value above 0.6 can be acceptable for inter-rater agreement in the questionnaire. While checking face validation, the researcher can use the expert's assessment and Cohen's Kappa index values for a given questionnaire.

Sociodemographic characteristics were analyzed by descriptive statistics and presented as frequency and percentage—bivariate tests using the Chi-square test. The p-value ≤ 0.05 was concluded to have a significant relationship. In this study, all data were statistically analyzed using IBM SPSS ver. 20.0 for Windows.

RESULTS

The number of subjects who fulfilled the inclusion criteria for this research was 508. In [table 1](#), there were 285 (56%) respondents under 20 years of age, and most were female 326 participants (64%). There were 408 (80.3%) respondents who graduated from high school ([Table 1](#)).

In [Table 2](#), those aged < 20 years have a 0.90 times less chance of knowing about hepatitis B and a 0.97 times less chance of agreeing to hepatitis B vaccination than those aged ≥ 20 years. Age significantly affects knowledge and perception of the hepatitis B vaccine ($p = 0.004$, $p = 0.03$). Males have a 0.90 times lower probability of knowing and 0.97 times more to disagree with hepatitis B vaccination than females. High school graduates have a 0.90 less possibility of knowing about Hepatitis and 0.98 times fewer possibilities of agreeing to hepatitis B vaccination than a diploma or bachelor. Sex and education significantly relate to knowledge of hepatitis B disease ($p = 0.022$, $p = 0.025$). Sex and education are not significantly related to the perception of hepatitis B disease ($p = 0.125$, $p = 0.266$) ([Table 2](#)).

This research revealed that 437 individuals knew hepatitis B, and 502 consented to hepatitis B vaccination ([Figure 1](#)). The primary motivation of this research was to provide free of charge hepatitis B vaccinations to as many as

223 individuals (43.9%). There were 184 participants (36.2%) who wanted to participate in scientific development, and 53 subjects wanted to get a compensation fee. Twelve respondents (10.4%) agreed to participate in the vaccination for government hepatitis B vaccination program (Figure 2).

The motivation of most respondents, based on age, sex, and education, is to get a free hepatitis B vaccination. Age and sex with encouragement had a significant relationship ($p < 0.001$; $p = 0.028$), while education had no significant association with motivation to take hepatitis B vaccination ($p = 0.714$) (Table 2).

DISCUSSION

This research aimed to evaluate Semarang residents' knowledge of hepatitis B infection. The result of this study is that 86% of respondents understood the hepatitis B virus well. Respondents recognize that hepatitis B is a liver inflammation caused by the hepatitis B virus and is communicable. In contrast, 14% of respondents did not know about hepatitis B, and some believed it to be a lung disease, jaundice, paralysis, and severe disease. This result is identical to

studies undertaken in Nigeria, Pakistan, and Ghana, where respondents have a good level of knowledge.^{1,4} The low level of knowledge is similar to research conducted in Northwest Ethiopia and Cameroon, where only 47% of respondents know about hepatitis B infection.²

Based on age-appropriate knowledge, respondents aged >20 better understood hepatitis B infection than those <20 years ($p = 0.004$). Fifty-one individuals aged <20 years had insufficient knowledge of hepatitis B, whereas 234 had good knowledge. Among responders older than 20 years, 223 had inadequate knowledge, whereas 203 respondents <20 years old had enough knowledge. This is consistent with Notoatmodjo's theory that experience is one of the elements influencing the amount of knowledge.¹⁵ The majority of respondents in the age group >20 years had a high level of knowledge, according to a study based on knowledge and age. Age influences an individual's vision and thinking. The older they get, the more their grasping power and mindset will develop so that more and more knowledge is gained.¹⁵

Based on the related knowledge and sex, the ratio of the number of males

and females who did not know about hepatitis B was not so different, namely 1:1 ($p = 0.022$). The result is that 289 out of 326 (89%) female respondents have adequate knowledge about hepatitis B, while 37 have insufficient information. In this study, 148 out of 182 (81%) male respondents have good knowledge, while 34 (29%) have inadequate knowledge. This result is similar to Denpasar's study, with female participants dominating. Seventy-five percent of respondents had a good understanding of hepatitis B disease, whereas just 25% had poor knowledge of Hepatitis B disease. The majority of respondents in both the male and female categories had a high level of expertise, according to a study examining the relationship between sex and knowledge.¹⁶

Regarding hepatitis B knowledge, respondents with a bachelor's degree were one time better than those with high school education levels ($p = 0.025$). Several factors support good learning, including education, training, information, and experience.¹⁷ Experience is one of the variables determining the degree of awareness. In this research, gaining knowledge about hepatitis B was one of the respondents' experiences. This follows the theory proposed by Notoatmodjo that one factor influencing knowledge level is experience. Experience is one source to obtain the truth of knowledge and in this study, getting information about hepatitis B became one of the experiences for respondents.¹⁵ Education is a process of changing attitudes and behavior of a person or group and also an effort to mature humans through teaching and training efforts; with high education, a person will tend to get information both

Table 1. Characteristic sociodemographic of respondents.

Characteristic	Total (N=508)	Percentage (%)
Age (Years)		
< 20	285	56.1
≥ 20	223	43.9
Sex		
Male	182	35.8
Female	326	64.2
Education		
High School	408	80.3
Diploma/Bachelor	100	19.7

Table 2. Relationship of demographic status to respondent knowledge and perception.

Variable	Knowledge				Perception				p ^a
	Don't Know	Know	RR (95%CI)	P	Disagree	Agree	RR (95%CI)	P	
Age									
< 20 years	51	234	0.90 (0.84-0.96)	0.004*	6	279	0.97(0.96-0.99)	0.030*	<0.001*
≥ 20 years	20	203	1.00		0	223	1.00		
Sex									
Male	34	148	0.91 (0.84-0.99)	0.022*	4	178	0.98(0.91-1.00)	0.125	0.028*
Female	37	289	1.00		2	324	1.00		
Education									
Highschool	64	344	0.90 (0.84-0.97)	0.025*	6	402	0.98(0.96-1.00)	0.266	0.714
Diploma/ Bachelor	7	93	1.00		0	100	1.00		

RR: Relative Risk; CI: Confidence Interval; *Statistically significant if p -value ≤ 0.05 ; p^a: relationship with motivation

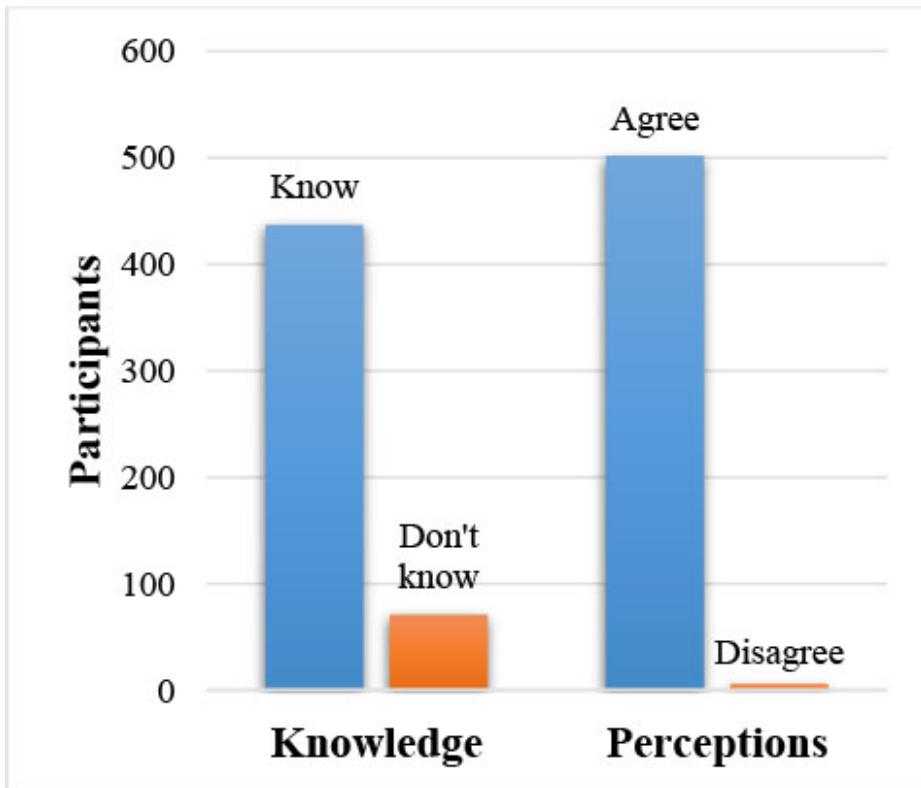


Figure 1. Distribution of data based on respondent's knowledge and perception

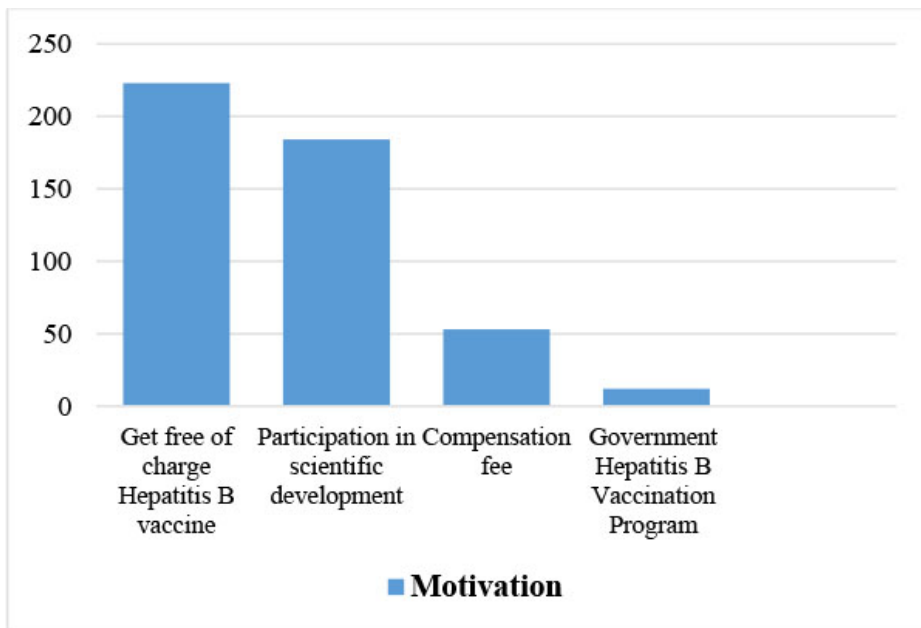


Figure 2. The motivation of respondents to take hepatitis B vaccination.

from other people and the mass media, the more information that comes in, the more the knowledge gained about health.^{18,19}

Knowledge has always been seen as one of the primary strategic sources capable of producing a competitive advantage in a sustainable long term. Knowledge is

the ability and organization of a person to understand and act effectively; having knowledge that supports can play a role in daily routine activities and can also manage everyone in dealing with new situations and take advantage of them when needed.²⁰

Knowledge of the disease, beliefs or practices, the experience of adverse effects, dread of being injected with chemicals from disease-causing bacteria, and mistrust or distrust in the medical care system impact perceptions of vaccination.^{14,21} Five hundred two participants accepted to be vaccinated against Hepatitis B (98.82 %), and six did not (1.18%). Age < 20 years had 0.90 times less possibility of knowing about hepatitis B than age \geq 20 years and 0.97 times less chance of consenting to the hepatitis B vaccine ($p = < 0.05$). One element that determines attitudes about hepatitis B vaccination is knowledge, which is influenced by experience.¹⁵ Experience is one source to obtain the truth of knowledge and in this study, getting information about hepatitis B became one of the experiences for respondents, so the higher a person's age, the more excellent the opportunity to know about vaccination and the more experience gained and the ease of absorbing information the better so that it correlates with the perception for Medfield.²²

In this study, the most common motivation for 226 participants was receiving a free of charge Hepatitis B vaccine (44.49 %). This study revealed that 184 respondents (36.2%) were motivated to participate in scientific development. Fifty-three individuals were encouraged by compensation. According to the previous study, people's desire to undergo vaccinations may be affected by their views of vaccination costs, such as vaccine safety, probable adverse effects, cost of vaccines, and time spent vaccinating. Low vaccine prices correlate to strong vaccination motivation.²³

After free-of-charge hepatitis B vaccination, this research found that scientific development was the second most motivating factor. Vaccines in development must pass clinical trials to assess the immunogenicity, safety, and effectiveness of vaccines administered to human volunteers.²¹ According to research by Tarimo et al., vaccines' creation and testing might encourage potential volunteers to engage in immunization. Consequently, it suggests that the growth of vaccination trial knowledge influences people's decisions to participate in vaccine trials.²⁴

In this research, the age and sex of respondents showed a significant relationship with motivation respectively. Personal characteristics such as age, gender, and level of education might impact a person's choice to engage in vaccination initiatives.²⁴ Gender also influences a person's decisions regarding vaccination. Previous studies reported that women's association between higher education and vaccination tends to be stronger. In women, the decision to participate in vaccination is influenced by the attitude of medical personnel and altruism, so prosocial behavior contributes to the desire to vaccinate.^{25,26}

There are limitations of the study that deserve attention. This research design was a cross-sectional study and only had 508 participants. Further research is needed using a larger sample size with different ages and educational backgrounds. There are some suggestions by the authors regarding the limitation of this study. First, our study was cross-sectional and assessed respondent perception, knowledge, and motivation at a specific time. Secondly, the sample size of our study might not be large enough to generalize the results. Further studies with different study designs, larger sample sizes, and different variables are needed to know about another factor influencing hepatitis B vaccine knowledge, perception, and motivation in Urban Area at Semarang.

CONCLUSION

This study expands our understanding of people's response to knowledge, perspective, and motivation to get a hepatitis B vaccination. Age and sex affect the knowledge and motivation of respondents to hepatitis B vaccination. The age of the respondents significantly influences perception. Education level affects knowledge about Hepatitis. Age and education are factors for having a better understanding of hepatitis B, thus providing a positive perception and motivation to participate in hepatitis B vaccination efforts.

CONFLICT OF INTEREST

The author(s) declare no potential conflicts of interest for this article's research, authorship, and publication.

ETHICAL CLEARANCE

The research obtained ethical clearance from Universitas Diponegoro, Ethics Committee (No.80/EC/FK UNDIP/III/2019). All responders provided their written informed consent in advance.

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AUTHOR CONTRIBUTION

These authors have contributed equally to this work and share the first authorship.

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