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Unveiling Factors Related to HB0 Immunization Services in Infants

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ABSTRACT

HB0 immunization is a hepatitis vaccine given to newborns within 24 hours after birth to prevent transmission of the hepatitis B virus. The provision of HB0 immunization is still far below the target. In South Lampung Regency in 2023, the lowest HB0 immunization coverage was at Talang Jawa Public Health Center at 87.7%, while the target was 100%. Several factors, including maternal knowledge, education, attitudes, and family support, may influence this low coverage. This study aimed to determine the factors related to infant health services regarding HB0 immunization. This is a quantitative study with a cross-sectional research design. The population in this study comprised all mothers who had newborn babies in 2024 in Talang Jawa, totaling 145 people across 7 villages, while the sample numbered 113. The sampling technique used was probability sampling, specifically simple random sampling. Univariate analysis used percentages, and bivariate analysis used the Chi-Square test. The results of this study indicate that maternal knowledge (p-value = 0.001), maternal education (p-value = 0.025), maternal attitude (p-value = 0.001), and family support (p-value = 0.001) are significantly related to the provision of Hb0 immunization. Providing counseling to pregnant women and involving cadres to encourage them to come to the health facility to learn about the importance of HB0 immunization; they understand that their babies must be immunized against HB0 to avoid transmission of Hepatitis B.

INTRODUCTION

Infant healthcare is crucial for ensuring the survival and optimal development of infants, encompassing a range of care and protection measures. Healthcare for newborns aims to ensure optimal survival, growth, and development. This includes protecting and ensuring that every infant receives the necessary care to prevent death and health complications. Healthcare should be provided early, especially for newborns who have never received healthcare before. One of the fundamental services in infant healthcare is immunization for newborns (Pertiwi, 2020).

The Ministry of Health Republic Indonesia (2017) has launched a phased, mandatory immunization program for newborns up to age 18, aimed at protecting children during their growth and development and preventing them from contracting dangerous diseases. One of the immunizations that must be given to newborns after 24 hours of age is the hepatitis B immunization (HB0). HB0 immunization is a hepatitis vaccine given to an infant within 24 hours of birth to prevent transmission of the hepatitis B virus. The provision of HB0 immunization is still far below the target.

According to the World Health Organization (2020), countries' immunization coverage for infants remained a problem, with global coverage at 84%, which has not yet reached the target of 90% of children aged 0-11 months worldwide. According to the 2024 Indonesian Health Profile, the national coverage of complete basic immunization is 95.4%, which is still below the set target of 100%. While the coverage of complete basic immunization in Lampung Province has reached 100.8%, the coverage of DPT-HB-HiB3 immunization has not yet reached 92.9%, despite a target of 100%. This includes the coverage of HB0 immunization, which has not yet reached the set target. Lampung can show high "complete basic immunization" coverage while having relatively

lower DPT-HB-HiB3 coverage because "basic immunization" is an aggregate administrative indicator that denominator issues and reporting can inflate, whereas DPT-HB-HiB3 is a specific third dose that is highly sensitive to dropout and service gaps (Ministry of Health Republic Indonesia, 2023; WHO & UNICEF, 2020). In practice, many infants start the immunization series but do not complete the third pentavalent dose, so this specific indicator tends to reveal underlying access, follow-up, and data-quality problems that are not visible in the broader basic immunization figure (Widyaningsih, 2022).

According to data from the Indonesian Ministry of Health Republic Indonesia, 7.1%, or 18 million Indonesians, are infected with Hepatitis B. Of this number, 50% are at risk of developing chronic hepatitis B, and 900,000 could develop liver cancer. Hepatitis B is the fourth leading cause of death, accounting for 51,100 deaths annually. Most infants receive the HBsAg vaccine within 24 hours; however, 135 infants aged 8 to 12 months test positive for Hepatitis B (Safitri et al., 2023).

Hepatitis B is caused by the Hepatitis B Virus (HBV), which can be either acute or chronic, and is among the most severe liver diseases. This is because hepatitis B often does not show clear symptoms, except for a slight yellowing of the eyes and skin, accompanied by lethargy. Sufferers are often unaware that they have been infected with HBV and unknowingly transmit it to others (Anggraini & Agustin, 2020). Hepatitis B disease can cause jaundice, even though yellowing (nails, eyes, skin) is only one symptom of hepatitis (Rasmiatin et al., 2023). Chronic HBV infection often causes significant liver disease in up to 25% of individuals who experience cirrhosis and liver cancer (Damayanti, 2023).

HB0 immunization is the first dose of the hepatitis B vaccine given to infants immediately after birth. This vaccine contains the hepatitis B virus surface antigen (HBsAg), which stimulates the infant's immune system to produce specific antibodies against the hepatitis B virus. This vaccination is crucial because hepatitis B can cause serious liver damage, including cirrhosis and liver cancer. The WHO recommends hepatitis B immunization as early as possible, ideally within 24 hours of birth, to reduce perinatal and horizontal transmission. The HB zero indicator is used as a program coverage indicator, representing the target's first contact with the immunization service, specifically when the target receives the HB0 immunization (Kartika et al., 2022).

According to the 2023 South Lampung Health District Profile, South Lampung Regency has 28 Community Health Centers (Puskesmas) that provide health services to infants and children. The coverage of health services to infants in 2023 was 98.1%, but it has not yet reached the 100% target. 16 Sub-district Puskesmas have achieved the 100% target, while 12 Puskesmas have not achieved the 100% target, with the lowest achievement being Talang Jawa Puskesmas (87.7%). Regarding the coverage of HB0 immunization (immunization given within 24 hours), which is 98.2%, this has exceeded the set target of 95%. However, 6.6% of individuals have received HB0 immunization at an age of more than 24 hours (1-7 days).

The low number of babies immunized with HB0 at 1–7 days is due to various factors, including knowledge, education, attitudes, and family support. This needs to be managed properly; if not addressed, it will result in a lack of immunity in babies against the hepatitis B virus, which can cause liver damage in babies and even cause liver cancer in the future. Providing HB0 immunization to babies protects them from exposure to the Hepatitis B virus (Sukrisno & Nadjib, 2022). Based on the above, researchers are interested in conducting a study to know determinants of infant health services (HB0 immunization) in the Working Area of the Talang Jawa Community Health Center, South Lampung Regency.

METHOD

This research is a quantitative study using analytical correlation. The research design used is cross-sectional. The study population comprised all mothers who delivered at the Talang Jawa Community Health Center, totaling 145 individuals from 7 villages in Talang Jawa. By using Slovin, the research sample comprised 113 individuals. The sampling technique used in this study was simple random sampling. Random sampling was conducted by the lottery method. The data collection process took place in April 2025 at the Talang Jawa Community Health Center in South Lampung and included both primary and secondary data. Primary data were obtained through

questionnaires, while secondary data were obtained from mothers' pregnancy health books, also known as the KIA book.

The data was analyzed using univariate and bivariate analysis. Univariate analysis was used to determine the frequency distributions of the observed variables and to characterize the variables in percentages. Bivariate analysis used the Chi-Square test. This study has ethical clearance number No.007/Perst.E/KEPK-TJK/II/2025.

RESULTS

Table 1. Respondent's characteristic

Variable	n	%
Mother's age		
< 20 Years	12	10.6
20-35 Years	87	77.0
> 35 Years	14	12.4
Occupation		
Housewife	81	71.7
Working	32	28.3
Immunization HB0		
Not given immediately after birth	32	28.3
Given immediately after birth	81	71.7
Maternal Knowledge About HB0 immunization		
Moderate	48	42.5
Good	65	57.5
Mother's Education		
Elementary – Middle School	45	39.8
Senior High School – Bachelor's Degree	68	60.2
Mother's attitude		
Does not support	45	39.8
Support	68	60.2
Family support		
Does not support	38	33.6
Support	75	66.4

Based on Table 1, the age distribution shows that the majority (77.0%) are aged 20-35 years. The distribution of respondents whose babies were given HB0 immunization immediately after birth was 81 babies (71.7%). Most of the respondents show that most of them have higher education (high school-bachelor's degree), as many as 68 mothers (60.2%). The respondents mostly received family support in providing HB0 immunization, with 75 mothers (66.4%).

Table 2. The Relationship between mothers' knowledge and the provision of HB0 immunization

Mother's knowledge	HB0 immunization administration				Amount		p-value	*OR*	95%CI
	Given immediately after birth		Not given immediately after birth						
	n	%	n	%	n	%			
Not enough	19	40.00	29	60.00	48	100			
Good	62	95.38	3	4.62	65	100	0.000	31.544	8.95 – 111.0
Amount	81	71.68	32	28.32	113	100			

Based on Table 2, mothers with insufficient knowledge had their babies immediately given HB0 immunization after birth, totaling 19 (40.00%). In contrast, those with sufficient knowledge had their babies not immediately given HB0 immunization after birth, totaling 29 (60.00%). Meanwhile, mothers with good knowledge, whose babies received HB0 immunization immediately after birth, numbered 62 (95.38%), and those whose babies did not receive HB0 immunization immediately after birth numbered 3 (4.62%). Chi-square test with α = 5% (0.05)

and CI = 95% yielded a p-value of 0.001, so Ho is rejected, indicating a significant relationship between maternal knowledge and infant health services regarding HB0 immunization. Mothers with greater knowledge are 31.544 times more likely to give HB0 immunization to their babies than mothers with less knowledge.

Table 3. Relationship between maternal education and HB0 immunization

Mother's education	HB0 Immunization administration				Amount		p-value	OR
	Given immediately after birth		Not given immediately after birth					
	n	%	n	%	n	%		
Elementary – Middle School	27	60.0	18	40.0	45	100	0.025	2.571
High School – Bachelor's Degree	54	79.4	14	20.6	68	100		
Amount	81	71.7	32	28.3	113	100		

Based on Table 3, it is known that mothers who have an elementary-junior high school education had their babies immediately given HB0 immunization after birth, numbered 27 (60.0%), and those whose babies were not immediately given HB0 immunization after birth numbered 18 (40.0%). Meanwhile, among mothers who have a high school-bachelor's education, their babies were immediately given HB0 immunization after birth, numbered 54 (79.4%), and among mothers whose babies were not immediately given HB0 immunization after birth, numbered 14 (20.6%).

The Chi-Square test with α = 5% (0.05) and CI = 95% yielded a p-value of 0.025, so Ho is rejected, indicating a significant relationship between maternal education and infant health services regarding HB0 immunization at the Talang Jawa Community Health Center. Mothers with a high school-bachelor's education have a 2.571 times greater chance of providing HB0 immunization when compared to mothers who have an elementary-junior high school education.

Table 4. Relationship between mother's attitude and HB0 immunization

Mother's attitude	HB0 Immunization Administration				Amount		p-value	OR
	Given immediately after birth		Not given immediately after birth					
	n	%	n	%	n	%		
Does not support	19	42.00	26	57.8	45	100	0.001	14.140
Support	62	91.2	6	8.8	68	100		
Amount	81	71.7	32	28.3	113	100		

Based on Table 4, it is known that mothers who have an unsupportive attitude have their babies immediately given HB0 immunization after birth. numbered 19 (42.0%) and their babies who were not immediately given HB0 immunization after birth numbered 26 (57.8%). Meanwhile, mothers who supported their babies receiving HB0 immunization immediately after birth numbered 62 (91.2%), and those who did not immediately immunize their babies numbered 6 (8.8%). Chi-square test with α 5% (0.05) and CI 95% obtained a p-value=0.001, so Ho was rejected, meaning there was a significant relationship between the mother's attitude and the provision of HB0 immunization. Mothers with a supportive attitude had a 14.140 times greater chance of providing HB immunization to their baby compared to unsupportive mothers.

Table 5. Relationship between family support and HB0 immunization

Family support	HB0 immunization administration				Amount		p-value	*OR*
	Given immediately after birth		Not given immediately after birth					
	n	%	n	%	n	%		
Does not support	10	26.3	28	73.7	38	100	0.001	49.70
Support	71	94.7	4	5.3	75	100		
Amount	81	71.7	32	28.3	113	100		

Based on Table 5, 10 mothers (26.3%) whose families did not support HB0 immunization immediately after birth, and 28 (73.7%) of their babies were not given HB0 immunization immediately after birth. Meanwhile, among mothers whose families supported HB0 immunization for their babies immediately after birth, 71 (94.7%) received it, and 4 (5.3%) did not. Chi-square test with α 5% (0.05) and CI 95% obtained a p-value = 0.001, so Ho was rejected, meaning there was a significant relationship between family support and infant health services regarding the provision of HB immunization. The statistical analysis revealed an Odds Ratio (OR) of 49.70, indicating a strongly significant association between family support and HB0 immunization administration. Families who provided support were 49.70 times more likely to have their newborns receive the HB0 immunization immediately after birth compared to those who did not provide support.

DISCUSSION

Distribution of infant health services frequency in the provision of HB0 immunization

Newborn healthcare is crucial for ensuring the survival and optimal development of infants, encompassing various aspects of care and protection. Furthermore, infant healthcare encompasses medical and non-medical efforts to ensure optimal growth and development and to address various health issues infants may experience. Newborn healthcare services aim to ensure optimal child survival and development. This includes protecting and ensuring that every infant receives the necessary care to prevent death and health complications. Healthcare services must begin early, especially for newborns who have never received healthcare before. One of the basic services in infant healthcare is immunization.

The Ministry of Health has launched a mandatory, gradual immunization program for children from birth to 18 years of age, aimed at protecting them during growth and development and preventing dangerous diseases. One of the immunizations that must be given to newborns after 24 hours of age is the hepatitis B immunization (HB0). HB0 immunization is a hepatitis vaccine given to newborns after 24 hours of birth to prevent transmission of the hepatitis B virus. The benefits of hepatitis B immunization will increase if given as early as possible, usually given at the age of 0 to 7 days by injection in the right thigh intramuscularly (Hadianti et al., 2015)

Health services for babies, according to standards, are the key to the success of providing HB0 immunization. HB0 immunization is the first dose of the hepatitis B vaccine given to infants immediately after birth. This vaccine contains the hepatitis B virus surface antigen (HBsAg), which stimulates the infant's immune system to produce specific antibodies against hepatitis B. This vaccination is crucial because hepatitis B can cause serious liver damage, including cirrhosis and liver cancer. WHO recommends hepatitis B immunization be administered as early as possible, ideally within 24 hours of birth, to reduce perinatal and horizontal transmission. The HB zero indicator is used as a program coverage indicator, meaning this is the target's first contact at the immunization service, namely, the target receiving the HB zero immunization. After the HB0 vaccine, the baby will need a second and third dose to ensure adequate protection (Damayanti, 2023).

Hepatitis B is caused by the Hepatitis B Virus (HBV), which can cause acute or chronic hepatitis, and is one of the most dangerous liver diseases. Unlike other liver diseases, hepatitis B often shows no clear symptoms, only a slight yellowing of the eyes and skin, accompanied by lethargy. Sufferers are often unaware that they have been infected with HBV and unknowingly transmit it to others (Anggraini & Agustin, 2020). This disease is widely known as jaundice, even though yellowing (nails, eyes, skin) is only one symptom of hepatitis (Sriatmi, 2018). Chronic HBV infection often causes significant liver disease in up to 25% of individuals who experience cirrhosis and liver cancer (Wiyanti et al., 2023).

The results of this study indicate that immunization implementation is significantly influenced by the quality of care mothers receive, including staff attitudes, service timeliness, and ease of access to health facilities. Health care through Hb0 immunization is crucial for preventing infants from hepatitis B infection, which can have long-term health impacts. Therefore, the author suggests that health workers who provide health services provide counseling to mothers from the

time of pregnancy about the importance of HB0 immunization immediately after the baby is born to prevent transmission of hepatitis B from the mother, so that the baby can be protected from hepatitis B infection, which can cause chronic liver disease.

Frequency distribution of mothers' knowledge about the provision of HB0 immunization

The results of this study indicate that of the 113 mothers, 65 (57.5%) had good knowledge about HBV immunization, and 48 (42.5%) had poor knowledge. This finding aligns with a study by Sonita et al. (2022) stated that the acceptance of immunization information in infants is caused by external factors, for example, good knowledge or understanding related to immunization. Mothers with good knowledge are more likely to vaccinate their babies.

According to Notoatmodjo (2019), knowledge is the result of "knowing," and this occurs after someone senses a particular object. Sensing in question is the sensing that occurs on an object through the five human senses, namely hearing, sight, smell, taste, and touch, so that most of human knowledge is obtained through the eyes and ears. Knowledge can be defined as understanding, which means that knowledge is obtained and acquired when an individual studies or observes an object and then applies it in everyday life (Damayanti et al., 2023)

Therefore, it can be concluded that knowledge influences the formation of a behavior and knowledge can also be called one of the factors that can influence attitudes and behavior in a person's life to provide a response or assessment of an object, therefore the discussion regarding knowledge in carrying out HB0 immunization on babies immediately after birth cannot be separated from the stage of behavior formation. Knowledge is an important component in determining actions, and behavior based on knowledge can persist longer than behavior that is not (Saragih et al., 2019).

On this basis, researchers suggest that health workers who care for babies always provide parents with information about the administration of HB0 immunization, which must be given immediately after birth to prevent hepatitis B transmission from mother to baby.

Distribution of maternal education frequency in providing HB0 immunization

The results of this study show that of the 113 mothers, 68 (60.2%) had higher education (high school-bachelor's degree) and 45 (39.8%) had lower education (elementary school-junior high school). The results of this study are in line with research entitled "Factors influencing HB0 immunization status in infants aged 0-7 days in the working area of the Sukabumi Community Health Center," which states that the mother's education level greatly influences the success of administering HB0 immunization to infants (Rasmiatin & Ekasari, 2023).

Education is a crucial factor in influencing knowledge. Mothers with a high level of education tend to be more receptive to information, while those with a low level of education are less likely to understand or accept it. Education influences a person's decision-making thought patterns. Mothers with a high level of education are more likely to digest advice from others than mothers with a low level of education (Ujud et al., 2023).

According to researchers, education level reflects a person's level of maturity in responding to their environment, thereby influencing their thinking and their responses to the knowledge around them. The higher a mother's education, the greater her chances of receiving accurate information about disease prevention and raising awareness of infant health issues. Educational status significantly influences a mother's immunization behavior for her baby.

Distribution of frequency of mother's attitude in providing HB0 immunization

The results of this study indicate that out of 113 respondents, 68 mothers (60.2%) showed a supportive attitude towards Hb0 immunization, while 45 mothers (39.8%) had an unsupportive attitude. This aligns with the research of Rasmiatin et al. (2023) which found that a positive maternal attitude strongly supports immunization provision.

A person's closed response or reaction to a particular stimulus or object, which essentially involves opinions and emotions related to happiness and displeasure, agreement and disagreement, good and bad, likes and dislikes, and so on (Fatma et al., 2023). A supportive

attitude towards HB0 immunization includes a positive stance that indicates a desire to immunize infants. A positive attitude towards immunization can also improve immunization quality and reduce the prevalence of hepatitis B.

The authors concluded that mothers' attitudes toward administering HB0 immunization to newborns were influenced by personal experiences, social norms, and information received, ultimately shaping their actual behavior in bringing their children for immunization. Mothers with supportive attitudes were less afraid of immunization side effects and had greater trust in health workers to provide services. With a supportive attitude towards HB0 immunization, mothers are more motivated to follow the recommended immunization schedule, thereby increasing the baby's chances of receiving early protection against infectious diseases. A supportive attitude reflects the mother's acceptance of HB0 immunization as an effort to prevent hepatitis.

Distribution of the frequency of family support in providing HB0 immunization

The results of this study showed that of the 113 respondents, 75 mothers (66.2%) received family support in providing HB0 immunization, while 38 mothers (33.8%) did not. These results are in accordance with research by Damayanti et al. (2023), which states that good family support can have a positive impact, such as taking them to the integrated health post (posyandu) to carry out immunization on time.

Family support is the transparent provision of actions, attitudes, and accurate health information, driven by the promotion of optimal health. Each family member in a small community plays a significant role in advocating for health-seeking actions, particularly the provision of complete basic immunizations for infants (Santoso, 2021).

Researchers concluded that family support provides emotional and practical motivation for mothers, including assistance in remembering immunization schedules, transportation to health facilities, and moral support in dealing with fears or doubts about immunization. Furthermore, family support includes providing information and assistance with facilities, such as transport to a community health center or hospital. Family support provides mothers with confidence and peace of mind when making decisions related to their child's health, including administering the HB0 immunization. Family support strengthens mothers' decisions to access immunization services available at health facilities.

The relationship between maternal knowledge and the provision of HB0 immunization

The results of this study showed a significant relationship between maternal knowledge and HB0 immunization provision at the Talang Jawa Community Health Center (p-value = 0.001; <0.05). Mothers with poor knowledge were less likely to provide HB0 immunization than those with good knowledge. These results indicate that the better the mother's knowledge of the importance of HB0 immunization, the higher the likelihood that the baby will receive HB0 immunization (OR 31,544).

The results of this study are in line with the study (Sonita et al., 2022b) in Mauraupu Village, South Tapanuli Regency stated that the acceptance of immunization information in infants is caused by external factors such as good knowledge or understanding regarding immunization, mothers who have good knowledge are more likely to provide immunization to their babies. In addition, research by Safitri et al. (2023) found a relationship between knowledge and the provision of HB0 immunization at Kereng Bangkirai Health Center (p-value = 0.000).

Knowledge is the result of human sensing or the result of someone knowing about an object. Sensing occurs through the five human senses: sight, smell, taste, and touch. In Lawrence W. Green's Precede-Proceed model, knowledge is one of the predisposing factors that influence the formation of health behavior. These predisposing factors include knowledge, attitudes, values, and beliefs that form the basis for a person's actions. In this context, with good knowledge, a mother is more likely to immunize her baby immediately. In accordance with Green's theory, which states that knowledge is expected to influence attitudes and behavior, thereby determining the good and bad of a person's behavior to improve health.

Based on the research results, mothers' knowledge about immunization will be applied in everyday life, and mothers with high knowledge will vaccinate their newborns and pay close

attention to their babies' health to prevent disease. Likewise, mothers with low knowledge will not know what to do for their babies, especially regarding immunization. Therefore, the action health workers should take is to implement routine counseling for the community, especially for mothers with babies. This counseling can be carried out at the Community Health Center and the Integrated Health Post, both individually and in groups. Counseling can be done using leaflets/posters.

The relationship between maternal education and the provision of HB0 immunization

The results of this study indicate a significant relationship between maternal education level and the provision of HB0 immunization (p-value = 0.025 (<0.05). Mothers with higher education (high school-bachelor's degree) were more likely to provide HB0 immunization than mothers with lower education (elementary school-junior high school).

The results of this study are in line with Rasmiatin et al. (2023) shows a p-value = 0.038, so there is a significant linear relationship between education variables and HB0 immunization in infants aged 0-7 days in the working area of Sukabumi Health Center. In addition, research Lamdayani & Wendra (2017) stated that 30 respondents who administered HB0 immunization with highly educated mothers were 27 respondents (90.0%) greater than those who did not do as many as 3 respondents (10.0%). This means that the higher the mother's education, the more information she receives, so she is more likely to immunize her baby.

The level of education is a very important factor in influencing knowledge. Mothers who have a high level of education tend to be more receptive to information; conversely, mothers who have a low level of education are less able to understand or have difficulty receiving information. Educational background influences a person's thought patterns when deciding on something. When mothers have a high level of education, they are more likely to accept suggestions from others than mothers with lower levels of education (Ujud et al., 2023). Education is a crucial factor influencing a person's acceptance and understanding of health information. Mothers with higher levels of education tend to be more receptive to information about the importance of HB0 immunization and are more aware of its benefits for their babies' health.

Based on the research results, the level of education influences behavior in administering HB0 immunization which can describe a person's level of maturity in responding to the environment so that it can influence insight into thinking or responding to knowledge around them, the higher the mother's level of education, the greater the opportunity to get the right information about the importance of immunization for disease prevention and have a high awareness of infant health problems.

The relationship between maternal attitudes and the provision of HB0 immunization

The results of this study indicate a significant relationship between maternal attitudes and the provision of HB0 immunization (p-value = 0.001; <0.05). Mothers with a supportive attitude towards immunization are 14.14 times more likely to have their babies receive HB0 immunization (OR 14.140).

Attitude is a person's response or reaction to a particular stimulus or object, which involves opinions and emotions related to happiness or unhappiness, agreement or disagreement, good or bad, liking or disliking, and so on (Nugrawati et al., 2019). The results of this study are in line with Utami's research (2020), which shows that mothers' supportive attitudes towards immunization are correlated with compliance in providing complete basic immunization. In addition, Rasmiatin et al. (2023) entitled "Factors affecting the status of HB0 immunization in infants aged 0-7 days in the Sukabumi Community Health Center work area " obtained the results of maternal attitudes in the Sukabumi Community Health Center Work Area, Probolinggo City towards HB0 immunization, namely 21 respondents (66.7%) and there was an influence of maternal attitudes towards immunization status with a p-value of 0.004.

A positive maternal attitude can be a predisposing or triggering factor that leads mothers to take their babies for immunization (Sriatmi, 2018). Attitude formation does not occur spontaneously; rather, it constantly occurs through interactions and is related to specific objects. Interactions within and outside a group can change attitudes or form new ones. Furthermore, a

mother's positive attitude toward immunization leads her to take her baby to a service center for complete immunization. Attitude is a form of evaluation or emotional reaction. A person's attitude toward an object is a feeling of support or dissupport for that object.

Based on the research findings, it was concluded that maternal attitudes are influenced by personal experiences, social norms, and information received, which ultimately contribute to actual behavior in bringing their children for immunizations. Mothers with supportive attitudes are less afraid of immunization side effects and have greater trust in health workers to provide services. With a supportive attitude, mothers are more motivated to follow the recommended immunization schedule, thereby increasing the likelihood that their babies will receive early protection against infectious diseases.

The relationship between family support and the provision of HB0 immunization

The results of this study indicate a very significant relationship between family support and HB0 immunization (p-value = 0.001; < 0.05). Mothers who receive family support for HB0 immunization have a 49.7 times greater chance of providing HB0 immunization than mothers who do not receive family support. The results of this study are in line with research by Damayanti et al. (2023) stating that respondents who receive family support in the provision of HB0 immunization are (90%) with the results of the Chi- Square Test showing a p -value = 0.003, which means there is a relationship between the provision of HB0 immunization and the timeliness of HB0 immunization. In addition, research Safitri et al. (2023) stated that the results of the Chi-Square test obtained a p-value = 0.000, which means that there is a significant relationship between family support and the provision of HB0 immunization to newborns at the Kereng Bangkirai Health Center.

Family support is the transparent provision of actions, attitudes, and accurate health information, driven by the promotion of optimal health. Each family member in a small community plays a significant role in advocating for health-seeking actions, particularly the provision of complete basic immunizations for infants (Lubis et al., 2024).

According to researchers, family support provides emotional and practical motivation for mothers, including assistance with remembering immunization schedules, transportation to health facilities, and moral support in addressing fears or doubts about immunizations. Furthermore, family support can take the form of information and even assistance with transportation to health centers or hospitals. Family support provides mothers with confidence and peace of mind when making decisions related to their children's health, including administering the HB0 immunization.

CONCLUSION

Factors related to infant healthcare (immunization HB0) include maternal knowledge, maternal education, maternal attitude, and family support. Health workers who provide health services are to improve education to mothers since pregnancy about administering HB0 immunization to babies immediately after birth and to mothers who have just given birth to be given informed consent about the importance and benefits of administering HB0 immunization within 24 hours after birth to prevent the occurrence of hepatitis B disease which can cause liver hardening and possibly liver cancer. Furthermore, for Community Health Centers to strengthen counseling programs on the importance and benefits of HBV immunization in preventing hepatitis B infection early on, and to optimize the role of health workers (midwives) and health cadres in providing accurate, continuous information to families.

AUTHOR'S DECLARATION

Authors' contributions and responsibilities

RW: Writing for original draft, conceptualization, review, data analysis, editing; **RR:** writing original draft (supporting), translating, article layout, methodology, editing; **MDDS:** data collection, visualization, article review, and editing.

Availability of data and materials

All data are available from all authors.

Competing interests

There is no conflict of interest in this study.

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