Original Article

Factors Affecting Provision of Basic Immunization for Infants at Popukoba Health Center, Jayawijaya, Papua

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Abstract

Immunization is generally done in infancy to protect infants from those infectious diseases that can be prevented by immunization (PD3I). The purpose of this study was to assess factors affecting the provision of basic immunization for infants at Popukoba Health Center, Jayawijaya Regency. This is a quantitative study with an analytic survey and cross-sectional study design. The population included in this study were all mothers who had infants aged between 10 to 12 months as many as 141 people. Sample was taken using an accidental sampling technique with a total of 114 infants using a questionnaire in a work area of Popukoba Health Center. The results of this study indicate that there are variables that have an effect on the completeness of basic immunization in infants, namely the knowledge variable of breastfeeding mothers (p = 0.049) with a large influence of 13.39% and the strength of the relationship (OR = 3.816), and the variable of health service accessibility (p = 0.004) with a magnitude of influence of 19.46% and the strength of the relationship (OR = 7.002), while other variables, namely attitudes, family support and support from health workers have no effect.

Keywords: accessibility, attitudes, family support, health worker support, Immunization, knowledge.

Introduction

Development of imunity against infectious disease is usually regarded as best method to prevent infectious diseases. Immunization (PD3I) is usually administered during infancy. It is because infants are very susceptible to disease considering the fact that a strong immune system has not yet formed in their bodies. Immunization can protect them from various diseases. Public Health Centers (Indonesian: Pusat Kesehatan Masyarakat/ Puskesmas) have an important position in health care and in creating healthy settings [1-7], including immunization coverage. Vaccines prevent an estimated 2.3 million infant deaths each year. However, 1 child dies every 20 seconds from a vaccine-preventable disease.

Immunization is one of the most cost-effective health investments (cheap) since it is proven to prevent and reduce incidents of morbidity, disability, and death due to PD3I which cause 2 to 3 million deaths each year. Unfortunately, there are still more than 19 million children in the world who are either not vaccinated or have received incomplete vaccinations, which have put them at greater risk for developing potentially deadliest diseases. Among these children, 1 in 10 has never received any vaccinations and generally goes undetected by the health system.[8]

Moreover, more than 2 to 3 million children worldwide die every year from various diseases that actually can be

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received any vaccinations and generally goes undetected by the health system.[8]

Moreover, more than 2 to 3 million children worldwide die every year from various diseases that actually can be prevented by immunization. Number of cases of measles, a preventable but very deadly disease, has multiplied during the first three months of 2019, compared to the same period in 2018. World Health Organization (WHO) affirmed that measles killed 140,000 people worldwide during 2018. WHO data show that the number appeared even though a vaccine was already introduced to the public, more than 50 years ago. Most of deaths occurred in children under two years of age and nearly 153,000 deaths occurred in the first month of life.[9] Basic immunization coverage in Indonesia in the last five years has always been above 85%. Infact, it still has not reached the target set by the Ministry of Health's Strategic Planning Division. In 2018, complete basic immunization in Indonesia was 90.61%. This figure is slightly below the strategic planning target in 2018 (92.5%). Besides, based on data and information related to basic immunization for infants, Papua is province with the lowest achievement of 29.60%.[10]

More importantly, based on the Directorate General of Disease Prevention and Control, Ministry of Health of the Republic of Indonesia 2019, the percentage of measles immunization coverage in infants by the province in 2018 set a target of 92.0%, but Papua's achievement was 70.6% , while polio immunization coverage only reached 60.96% (target 95%). It indicates that Papua has not yet reached targets. In 2018, the village coverage target of UCI (Universal Child Immunization) in Indonesia was 82.13% and Papua Province was designated as province with lowest achievement with a percentage of 40.48%. [11] Expected achievement of polio immunization was actually around 95 percent. However, there were still 29 regencies and cities in Papua whose immunization achievements were only about 50%. Papua Provincial Health Office has up to now noted that achievement of Sub National Immunization Week (PIN) for Polio is still very low; Jayawijaya Regency is one of the regencies with immunization achievement that has not reached 50% (47.5%).[12]

Data from Jayawijaya Health Office Profile presented that from 26 Public Health Offices in Jayawijaya Regency area, Popukoba Health Office is the one where there were still quite high cases of Infant Mortality Rate (IMR) and Under-Five Mortality Rate (U5MR). Based on reports from Integrated Service Post and Popukoba Health Office, cases of infant mortality and under-five mortality were found. With a total population of 6,994, there are five villages in a work area of Popukoba Health Office: Popukoba, Waima, Yomote, Yelelo, Hugima (Popukoba Health Center Profile, 2019).

Based on previous studies, there are many factors affecting immunization status. These factors are adopted from Lawrence Green's theory 1980 [13], including: 1) predisposing factors which consist of age, education level, employment status, knowledge, and attitudes; 2) reinforcing factors which consist of family support, support from cadres, midwives and/or health workers; and 3) enabling factors which consist of facilities, perceived costs, perceived time, health service accessibility.

This is in line with a study conducted Marniati *et al.*[14] on factors affecting basic immunization administration for infants which included knowledge, education, parental work, attitudes, immunization services, and motivation, and immunization information. Additionally, according to Notoatmodjo, knowledge is a very important domain for the formation of one's actions which can lead to changes in perceptions and the formation of consistent attitudes. Knowledge forms good attitudes and actions in encouraging immunization, to reduce the child mortality rate.[15]

The background of this study shows that Papua is a province with the lowest immunization achievement,where Jayawijaya Regency is one of the regencies with immunization achievement that has not reached 50%. Data from Jayawijaya Health Office Profile presented that from 26 Public Health Offices in Jayawijaya Regency area, Popukoba Health Office is one of the Public Health Offices where there were still cases of Infant Mortality Rate (IMR) and Under-Five Mortality Rate (U5MR). Immunization coverage in a work area of Popukoba Health Center was still low since percentage of immunization coverage had not reached the specified target. Therefore, researchers were interested in conducting a study on factors affecting basic immunization administration for infants at Popukoba Health Center, Jayawijaya Regency.

This study aimed at assessing factors affecting the provision of basic immunization for infants at Popukoba Health Center, Jayawijaya Regency.

Materials and Methods

Type of Research

This study is quantitative research with an analytic survey, and cross-sectional study design. It aimed to find out the effect of an independent variable on dependent variable where measurement was between cause and effect at the same time.

Location and Time of Research

This study was carried out at Popukoba Health Office, Jayawijaya Regency, Papua in August 2020.

Population And Sample

The population in this study were all mothers who

had infants aged between 10 to 12 months in 2020 in the work area of Popukoba Health Center, Jayawijaya Regency, with a total of 141 infants. A sample is a part taken from population (whole object studied) and is considered to be representative of the entire population of 114 infants. Sampling was done by using accidental sampling technique; by taking individuals (infants aged 10-12 months) who could be reached or met during study at Popukoba Health Center, Jayawijaya Regency, Papua.

Here are some criteria that a sample needed to have:

1. Mothers who have infants aged between 10-12 months.
2. Mothers who have a child's immunization record (Health Card/Immunization Card/other health cards recording immunization data).
3. Is present during data collection.
4. Infant was born normal and healthy

Data Collection Technique

Data collection was carried out through primary data and secondary data. Primary data were obtained by having interviews using a questionnaire provided, while secondary data were obtained from collecting documents such as the health profile of Popukoba Health Center, annual reports of Popukoba Health Center, and others.

Data Collection Instruments

Data collection was carried out using a questionnaire form containing a list of questions, distributed in written form to a number of subjects to obtain responses, informations, answers, and so on. The questionnaire was in the form of a closed question which was adopted from a previous study using a Likert scale in the form of a statement. Questionnaire used referred to the results of a study by Amir *et al.*[16], which had gone through a validity and reliability testing process and checking process for its suitability for research location.

Data Processing and Analysis

Data processing on respondent's answers from questionnaire was carried out using SPSS version 20. Data analysis, namely univariate analysis, and bivariate analysis was carried out to assess the effect of each of dependent and independent variables. Data were analyzed using Chi-Square test. If there were cells that had a value less than 5, Fisher's Exact was used. The hypothesis was tested with a significance level of $\alpha = 0.05$. Data were also analyzed using multivariate analysis using logistic regression test, which was conducted to determine the effect of the independent variable on a dependent variable. This multivariate analysis was used to determine the most influential variable on basic immunization administration.

Research Result

Univariate Analysis

Table 1: Characteristics of Respondents and Univariate Analysis in Work Area of Popukoba Health Center, Jayawijaya Regency in 2020.

Characteristics of Respondents and Univariate Analysis	N=114	Percentage(%)
Age Group (years)		
19 – 28	53	46.5
29 – 38	35	30.7
39 – 47	26	22.8
Last Education		
High	107	93.9
Low	7	6.1
Mother's Occupation		
Employed	104	91.2
Unemployed	10	8.8
Mothers' Knowledge		
Sufficient	44	38.6
Insufficient	70	61.4
Breastfeeding Mothers' Attitude		
Positive	51	44.7
Negative	63	55.3
Family Support		
Sufficient	59	51.8
Insufficient	55	48.2
Health Worker Support		
Sufficient	62	54.4
Insufficient	52	45.6
Service Accessibility		
Sufficient	57	50.0
Insufficient	57	50.0
Provision of Basic Immunization		
Complete	20	17.5
Incomplete	94	82.5
Total	114	100.0

Bivariate Analysis of Research Variables

Table 2: Distribution of Breastfeeding Mother's Knowledge-Based on Provision of Basic Immunization in Work Area of Popukoba Health Center, Jayawijaya Regency in 2020

Knowledge	Provision of Basic Immunization		Total	P
	Complete	Incomplete		
Sufficient	3(6.8%)	41(93.2%)	44(100.0%)	0.017
Insufficient	17(24.3)	53(75.7%)	70(100.0%)	
Total	20(17.5%)	94 (82.5%)	114 (100.0%)	

Table 2 shows that insufficient knowledge of breastfeeding mothers had a significant effect on the completeness of basic immunization for infants. It can be seen from the percentage of incomplete basic immunization which was higher than the percentage of complete basic immunization that was 53 or 75.7%.

Results of statistical tests using chi square test obtained a significance level of 0.017, indicating that there was a significant relationship between knowledge of breastfeeding mothers and completeness of basic immunization for infants.

Table 3: Distribution of Attitudes of Breastfeeding Mothers Based on Provision of Basic Immunization in Work Area of Popukoba Health Center, Jayawijaya Regency in 2020

Attitude	Provision of Basic Immunization		Total	P
	Complete	Incomplete		
Positive	10 (19.6%)	41 (80.4%)	51 (100.0%)	0.602
Negative	10 (15.9%)	53 (84.1%)	63 (100.0%)	
Total	20(17.5%)	94 (82.5%)	114 (100.0%)	

Table 3 shows the distribution of attitudes towards the completeness of basic immunization for infants. The percentage of incomplete basic immunizations was higher than the complete basic immunizations, namely 53 (84.1%) and 10 (15.9%). Results of statistical tests using chi square test obtained a significance level of 0.602, indicating that there was no significant relationship between attitudes of breastfeeding mothers and completeness of basic immunization for infants.

Table 4: Distribution of Family Support Based on Provision of Basic Immunization in Work Area of Popukoba Health Center, Jayawijaya Regency in 2020.

Family Support	Provision of Basic Immunization		Total	P
	Complete	Incomplete		
Sufficient	12(20.3%)	47(79.7%)	59(100.0%)	0.416
Insufficient	8(14.5%)	47(85.5%)	55(100.0%)	
Total	20(17.5%)	94(82.5%)	114(100.0%)	

The Table 4 shows the distribution of family support for completeness of basic immunization administration for infants. The percentage of incomplete basic immunization was higher than the complete basic immunization, 47 (85.5%) and 8 (17.5%). Results of statistical tests using the chi square test obtained a significance level of 0.416, indicating that there was no significant relationship between family support and completeness of basic immunization administration for infants.

Table 5 shows that insufficient health worker support for breastfeeding mothers had a significant impact on the completeness of basic immunization administration for infants. This can be seen from the percentage of incomplete basic immunization that was higher than complete basic immunization, namely 38 (73.1%) and 14 (26.9%). Results of statistical tests using the chi square test obtained a significance level of 0.016, indicating that there was a significant relationship between health worker support for breastfeeding mothers and completeness of basic immunization administration for infants.

Table 5: Distribution of Health Worker Support Based on Provision of Basic Immunization in Work Area of Popukoba Health Center, Jayawijaya Regency in 2020.

Health Worker Support	Provision of Basic Immunization		Total	P
	Complete	Incomplete		
Sufficient	6 (9.7%)	56 (90.3%)	62 (100.0%)	0.016
Insufficient	14 (26.9%)	38 (73.1%)	52 (100.0%)	
Total	20(17.5%)	94 (82.5%)	114 (100.0%)	

Table 6: Distribution of Health Service Accessibility Based on Completeness of Provision of Basic Immunization in Work Area of Popukoba Health Center, Jayawijaya Regency in 2020.

Immunization Service Accessibility	Provision of Basic Immunization		Total	P
	Complete	Incomplete		
Sufficient	3(5.3%)	54(94.7%)	57(100.0%)	0.001
Insufficient	17(29.8%)	40(70.2%)	57(100.0%)	
Total	20(17.5%)	94(82.5%)	114(100.0%)	

Table 6 shows that adequatehealth service accessibility had a significant impact on the completeness of the provision of basic immunization for infants. This is clear from the percentage of incomplete basic immunization that was higher than the complete basic immunization, namely 40 (77.2%) and 17 (29.8%). Results of statistical tests using the chi square test obtained a significance level of 0.001, indicating that there was a significant relationship between health service accessibility and completeness of basic immunization administration for infants.

Table 7: Factors Affecting Completeness of Provision of Basic Immunization in Work Area of Popukoba Health Center, Jayawijaya Regency in 2020.

		B	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Step 1a	Knowledge of Breastfeeding Mothers	1.230	0.075	3.421	0.884	13.237
	Health Worker Support	0.853	0.133	2.347	0.770	7.151
	Health Service Accessibility	1.826	0.007	6.208	1.651	23.343

Multivariate Analysis of Research Variables Logistic Regression

Table 7 shows that of these three variables (knowledge of breastfeeding mothers, health worker support, and access to health services), most influential variable on completeness of basic immunization administration for infants was health service accessibility (p = 0.007) with an effect of 1.826 or 18,26%. In addition, knowledge of breastfeeding mothers and health worker support did not affect basic immunization administration.

Discussion

Knowledge

In variable of knowledge, the results of statistical tests showed that there was a significant relationship between knowledge of mothers about immunization and timeliness of its administration with a significance level of 0.017. This timeliness of its administration with a significance level of 0.017. This is consistent with several other studies such as studies conducted by Senewe at Tongkaina Health Center, Bunaken, Manado in 2017 (p=0.012) 38, by Riyanto in Serang in 2013 (p=0.000) 39, by Isnaini in Mororejo Village, Kaliwungu Sub-District, Kendal(p=0.000) 28 as well as a study carried out by Triana in Kuranji Sub-District, Padang (p=0.007).

This study discovered that mothers who had the sufficient knowledge about immunization had highest immunization timeliness, namely 79.7%. Based on results obtained in the field, the knowledge factor became a dominant part in influencing willingness to come and carry out immunization. It was also found in the results of the prevalence ratio (PR) test that mothers who had sufficient knowledge had a 2 times higher or greater likelihood of administering immunization appropriately than those who had insufficient knowledge. This is in line with a previous study conducted by Hindriyawati that more level of maternal knowledge results in more awareness of mothers in administering basic immunization.

Furthermore, mothers who possesssufficient knowledge, of course, find it easier to understand matters related to immunization so they tend to be more obedient in bringing their children to get an immunization. There is a high probability that someone's knowledge can increase overtime. Thus, the success of immunization programs can be achieved through public awareness so that it can have an impact on the welfare of the community in general and welfare of children in particular. People who have knowledge about something tend to apply this knowledge in their daily life, including knowledge about immunization. Parents/mothers with sufficient knowledge about immunization will certainly provide complete basic immunization for their infants and pay attention to the timeliness of immunization administration. On the other hand, mothers who have insufficient knowledge have no idea what to do with their infants, especially regarding immunization. Accordingly, as an attempt to increase the knowledge of parents, implementation of regular outreach to the community should endeavor especially for mothers with infants. This outreach or counseling can be carried out at Public Health Center or Integrated Service Post, either individually or in groups. This can also be done by distributing leaflets/posters or through social media.

Attitude

Referring to the results of this study, the mother's attitude is influenced by the condition of each individual perspective and background. More developed mindset and increased experience make mothers sort out what is good and bad for their infants, from which an attitude is formed. Attitude of respondents is related to basic immunization administration, where results of this study showed that lower the level of knowledge, lower the possibility of administering basic immunization to infants. This is due to the lack of appropriate attitudes towards prevention in changing their actions or behavior. Since respondents have a negative attitude, they do not respond to information received so they cannot make good decisions, and are not aware of the dangers of disease, if infants do not get an immunization.

Basically, the attitudes of respondents in this study include a feeling of comfort felt by mothers when and where their children get an immunization, attitudes of mothers about effects of immunization, and religious views (halal/haram) about immunization. Factor affecting the number of respondents who have negative attitudes about immunization is insufficient knowledge about immunization which can make a major contribution to formation of unfavorable/negative attitudes. Someone who already knows the truth about something will also have a positive attitude towards it, including immunization administration. Formation of this attitude is also inseparable from other people who are considered important, mass media, emotional factors from individuals as well as experiences about immunization.

Family Support

In family support factor, results of this study showed that the percentage of incomplete basic immunization was higher than the complete basic immunization. This can be seen from percentage of complete basic immunization, which was greater than percentage of incomplete basic immunization, 47 (85.5%) and 8 (17.5%). However, results of statistical tests using the chi square test obtained a significance level of 0.416, indicating that there was no significant relationship between family support for breastfeeding mothers and

completeness of basic immunization administration for infants. This is in line with a study showing that there was a relationship between family support and completeness of basic immunization with p value = 0.000 < 0.05.[17]

This form of support is the provision of materials that can provide direct assistance such as giving money, providing goods, food, and services that can reduce stress since individuals can immediately solve problems related to material needs. Results of National Survey[18] stated that family support is closely related to health problems, with most individuals getting more help from their families than any other sources.

Health Worker Support

Based on the results of this study, sufficient health worker support for breastfeeding mothers in a work area of Popukoba Health Center, Jayawijaya Regency had a significant impact on the completeness of basic immunization administration for infants. It is supported by a study done by Pinna *et al.*[19] showing that there was a relationship between health services and maternal compliance in providing basic immunization; most of the respondent's health services are good. Good health worker services for patients are influenced by their patience and professionalism, which greatly affects patient's satisfaction. Health worker services can affect basic immunization for children with the reason that mothers and children are satisfied with services provided by health workers. Another similar study was conducted by Ratna Juwita, which showed a relationship between health worker support and basic immunization status for infants in Sungai Air Putih Village, Sungai Lala Sub-District. Based on this study, the majority of health worker support for complete basic immunization for infants was low (52.9%).

Health workers are spearheading the health services throughout Indonesiaat the top level, namely Health Office, and Public Health Center as a frontline in improving the quality of their services. This requires the health workers to further improve interaction and good communication in synergy to provide services to the community, especially mothers and infants in obtaining complete information and immunization during their growth period. This support is urgently needed by mothers in visiting Public Health Centers and administering immunization for their infants. Results of this study have proven that majority of the infants from mothers who received high support from health workers received complete immunization.

Health Service Accessibility

This study found that health service accessibility had a significant effect on the completeness of basic immunization administration for infants. With very diverse geographical situations and conditions, access to health facilities is a significant challenge in providing immunization services evenly throughout Indonesia. The absence of easy and cheap access can make it difficult for people, especially those with low income, to obtain immunization services for their children. Failure to achieve the target of complete immunization coverage can be influenced by how the community can access health facilities. Those who live in urban areas that have complete health facilities, both hospitals, and clinics, can easily get immunization. However, those who live in rural areas with limited facilities find it difficult to administer immunization for their infants. More importantly, costs that must be paid for immunization sometimes become a reason why under-five children do not get an immunization. In this study, health service accessibility is one of factors in administering immunization to infants, given the geographical conditions of the Jayawijaya Regency which are of considerable concern to the government. Road access and location conditions are important factors in improving health service quality as a whole and in giving immunization at each Public Health Center to mothers who have infants.

Complete Immunization Administration

Immunization status was analyzed in children aged between 12-23 months based on information from mothers and through source information notes on Health Card, Maternal and Child Health Book, and records in other children's health books. Complete basic immunization is a combination of each type of immunization (HB 0-3, BCG, Polio 1-4, DPT 1-3, and Measles) administered to children. If one of those three sources states that the child has been immunized, it is concluded that the child has been immunized for a type of immunization in question. Based on the results of this study on 114 respondents, it can be concluded that most children received complete basic immunization with a total of 20 children (17.5%), while the other 94 children (82.5%) did not get complete basic immunization.

Conclusion and Recommendation

This study concludes that factors of provision of basic immunization for infants at Popukoba Health Center, Jayawijaya Regency. Attitudes have no significant relationship with factors of basic immunization administration for infants at Popukoba Health Center, Jayawijaya Regency. Importantly, family support is not related to factors of basic immunization administration for infants at Popukoba Health Center, Jayawijaya Regency. Health worker support is not related to the factors of basic immunization administration for infants at Popukoba Health Center, Jayawijaya Regency. Health Service Accessibility is related to factor of basic immunization administration for infants at Popukoba Health Center, Jayawijaya Regency. In terms of immunization completeness status, most children received complete basic immunization. Results of

this study indicate that the most influential variable is accessibility. This study also recommends the need to improve communication and information about the importance of immunization for infants, especially for mothers with a low level of education, poor socioeconomic status, and unemployed. In addition, it is necessary for health workers to make visits to families who face difficulty in accessing health facilities.

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